



200/225 OPTIMAX DTS INSTALLATION MANUAL

Table of Contents

Notice to Installer	2	Connecting 14 Pin Data Harness - Single Engine.....	14
Installation Information	2	Connecting 14 Pin Data Harness - Dual Engine	15
Avoiding Loss of Throttle and Shift Control.....	2	Installing DTS Command Module and Harness - Single Engine.....	16
Before Starting the Engine.....	2	Installing DTS Command Module and Harness - Dual Engine/Single Helm.....	20
Fuel Requirements.....	2	Battery Cable Size For Outboard Models.....	21
Oil Recommendation.....	2	Battery Information.....	23
Avoiding Fuel Flow Restriction	2	Connecting Battery Cables and DTS Power Harness.....	23
Electric Fuel Pump	3	Connecting Fuel Tank, Oil Tank and Speed Sensor.....	26
Boat Horsepower Capacity	3	Switched 12V Accessory Connection.....	28
Selecting Accessories For Your Outboard	3	DTS Wiring - Single Engine.....	29
Fuel Tanks	3	DTS Wiring - Dual Engine.....	31
Portable Fuel Tank	3	System Wiring Installation Checklist.....	32
Permanent Fuel Tank	3	Fuel Hose and Oil Hose Connections	32
Installation Specifications	4	Fuel Hose Connection	32
Lifting the Outboard	4	Filling the Fuel System	33
Applying Counter Rotation Decals	5	Filling the Oil System	33
Steering Cable - Starboard Side Routed Cable ...	5	Priming Oil Injection Pump	34
Steering Link Rod Fasteners	6	Purging Air From the Engine Oil Tank	36
Determining Recommended Outboard Mounting Height	7	Propeller Installation	36
Drilling Outboard Mounting Holes	8	Trim In Pin	37
Front Clamp Assembly	9	Paddle Wheel Speed Sensor Installation (If Equipped)	38
Removal	9	Parts Provided	38
Installation	9	Selecting Location	38
Wiring and Installation	11	Transom Angle Requirements	39
Wire Color Code Abbreviations.....	11	Installing Bracket	39
Installation Guidelines for DTS System Components.....	11	Routing the Cable	40
Data Harness Pulling Procedure.....	11	Installing and Removing the Paddle Wheel ...	41
Junction Box (If Equipped).....	12	Wiring Connections	41
Non-Mercury Marine Provided Ignition Switch.....	12	Template - Paddle Wheel Speed Sensor	42
Wiring Accessories.....	13		
System Wiring Reference Points.....	13		

Notice to Installer

This Product Requires Electronic Calibration Before Use.

Installation of this product will require electronic calibration. This calibration must not be attempted by anyone other than the Original Equipment Manufacturer (OEM) or a Mercury technician trained in Digital Throttle and Shift systems (DTS) at an authorized Mercury dealership. Improper installation and calibration of the DTS product will result in a system which is inoperable or unsafe for use.

Installation Information

Avoiding Loss of Throttle and Shift Control

WARNING

To avoid the possibility of serious injury or death from loss of boat control, do not splice or probe into any wire insulation of the DTS system. Splicing or probing will damage the wire insulation allowing water to enter the wiring. Water intrusion may lead to wiring failure and loss of throttle and shift control.

Before Starting the Engine

CAUTION

Avoid engine damage. Prime the oil injection pump on new or rebuilt engines and after maintenance is performed on the oiling system.

Refer to **Priming the Oil Injection Pump** for instructions.

Fuel Requirements

Do not use pre-mixed gas and oil in this engine. The engine automatically receives extra oil during engine break-in. Use a fresh supply of the recommended gasoline during engine break-in and after engine break-in.

Oil Recommendation

Recommended Oil	OptiMax Oil or Premium Plus 2-Cycle TC-W3 Outboard Oil
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OptiMax Oil or Premium Plus TC-W3 is a higher grade oil that provides increased lubrication and extra resistance to carbon buildup when used with good or varying grades of gasoline.

IMPORTANT: Oil must be NMMA certified TC-W3 2-Cycle oil.

Periodically consult with your dealer to get the latest gasoline and oil recommendations. If Mercury Precision or Quicksilver 2-Cycle Outboard Oil is not available, substitute another brand of 2-Cycle outboard oil that is NMMA Certified TC-W3. The use of an inferior 2-Cycle outboard oil can reduce engine durability. Damage from use of inferior oil may not be covered under the limited warranty.

Avoiding Fuel Flow Restriction

IMPORTANT: Adding components to the fuel supply system (filters, valves, fittings, etc.) may restrict the fuel flow. This may cause engine stalling at low speed, and/or a lean fuel condition at high RPM that could cause engine damage.

Electric Fuel Pump

The fuel pressure must not exceed 28 kPa (4 psi). If necessary, install a pressure regulator.

Boat Horsepower Capacity

WARNING

Using an outboard that exceeds the maximum horsepower limit of a boat can: 1) cause loss of boat control 2) place too much weight at the transom altering the designed flotation characteristics of the boat or 3) cause the boat to break apart particularly around the transom area. Overpowering a boat can result in serious injury, death or boat damage.

Do not overpower or overload your boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact your dealer or the boat manufacturer.

U.S. COAST GUARD CAPACITY	
MAXIMUM HORSEPOWER	XXX
MAXIMUM PERSON CAPACITY (POUNDS)	XXX
MAXIMUM WEIGHT CAPACITY	XXX

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Selecting Accessories For Your Outboard

Genuine Mercury Precision or Quicksilver Accessories have been specifically designed and tested for your outboard. These accessories are available from Mercury Marine dealers.

WARNING

Check with your dealer before installation of accessories. The misuse of acceptable accessories or the use of unacceptable accessories can result in serious injury, death, or product failure.

Some accessories not manufactured or sold by Mercury Marine are not designed to be safely used with your outboard or outboard operating system. Acquire and read the installation, operation, and maintenance manuals for all your selected accessories.

Fuel Tanks

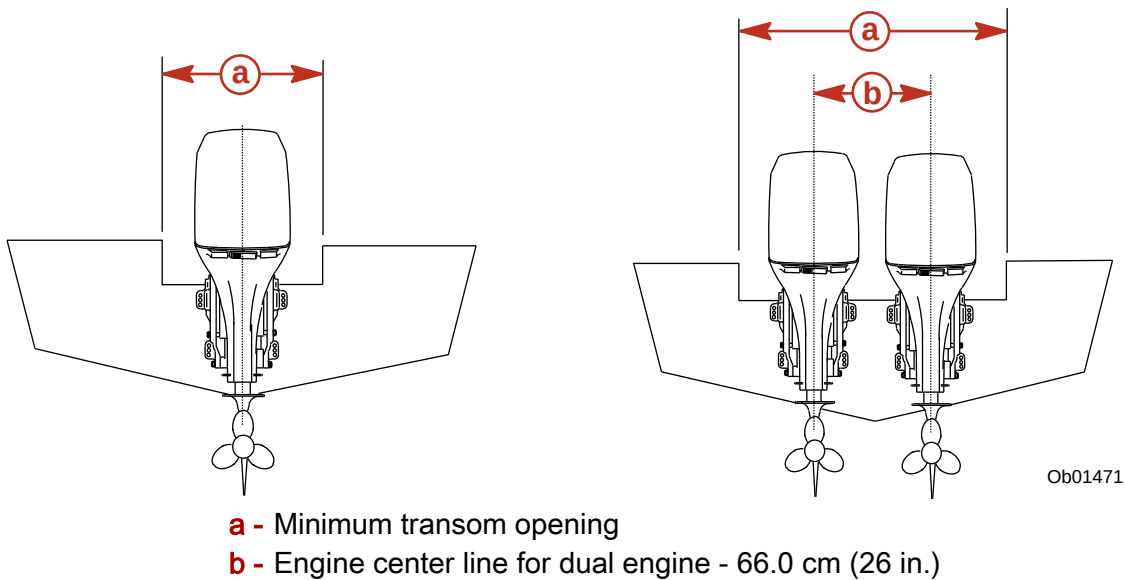
Portable Fuel Tank

Select a suitable location in the boat within the engine fuel line length limitations and secure the tank in place.

Permanent Fuel Tank

Permanent fuel tanks should be installed in accordance with industry and federal safety standards, which include recommendations applicable to grounding, anti-siphon protection, ventilation, etc.

Installation Specifications



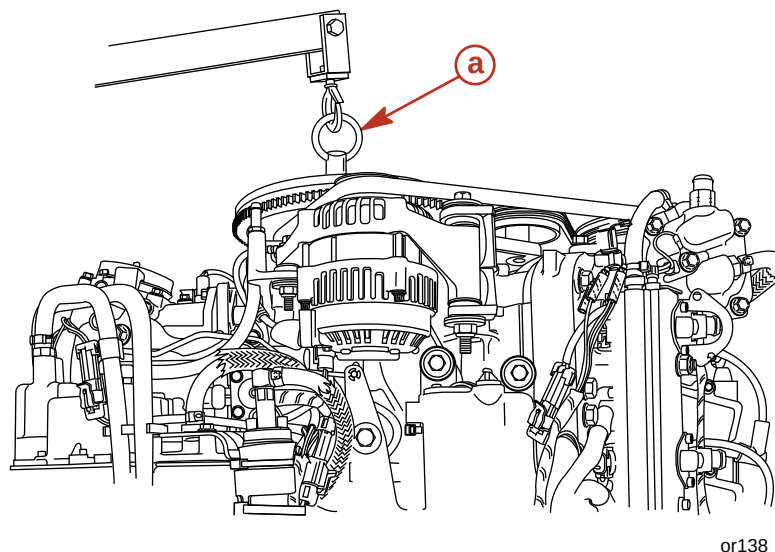
Minimum Transom Opening	
Single engine	99.0 cm (39 in.)
Dual engine	165.0 cm (65 in.)

Lifting the Outboard

⚠ WARNING

Avoid possible serious injury or death. Before lifting the outboard, verify that the lifting ring is threaded into the flywheel for a minimum of five turns and that the hoist has the correct lifting capacity for the engine weight.

1. Remove the cowl from the outboard.
2. Thread the lifting eye into the flywheel hub for a minimum of five turns.



a - Lifting eye

3. Connect a hoist to the lifting eye.
4. Lift the outboard and place it on the boat transom.

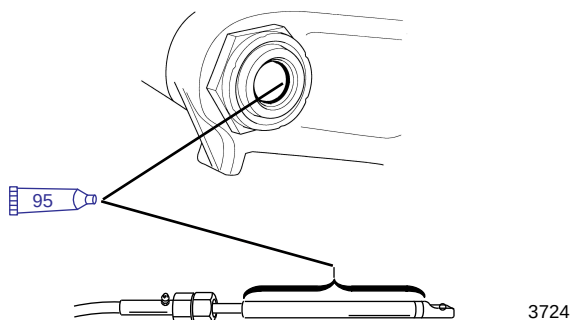
Applying Counter Rotation Decals

IMPORTANT: For dual outboard counter rotation installation, the left- hand rotation outboard is generally placed on the port sided of the transom.

1. Apply counter rotation decal (supplied with left-hand rotation outboard) onto right-hand rotation outboard.
2. Match decal placement with left-hand rotation outboard.

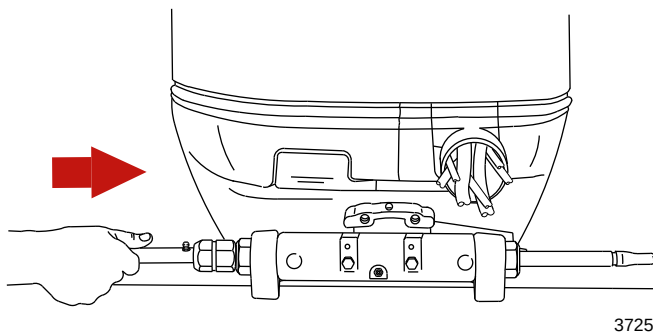
Steering Cable - Starboard Side Routed Cable

1. Lubricate O-ring seal and entire cable end.

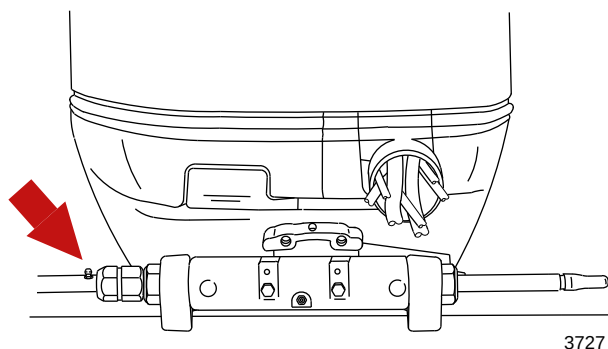


Tube Ref. No.	Description	Where Used	Part Number
 95	2-4-C with Teflon	O-ring seal and the entire cable end.	92-802859A1

2. Insert steering cable into tilt tube.



3. Torque nut to specification.



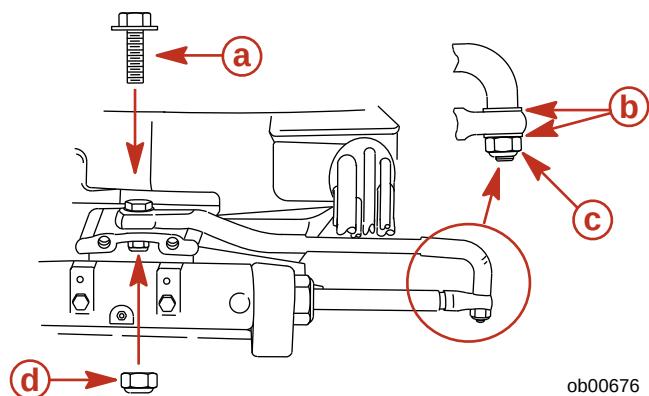
Description	Nm	lb. in.	lb. ft.
Nut	47.5		35

Steering Link Rod Fasteners

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using special washer head bolt ("a" - Part Number 10-849838) and self-locking nylon insert locknuts ("c" & "d" - Part Number 11-826709113). These locknuts must never be replaced with common nuts (non-locking) as they will work loose and vibrate off freeing the link rod to disengage.

⚠ WARNING

Disengagement of a steering link rod can result in the boat taking a full, sudden, sharp turn. This potentially violent action can cause occupants to be thrown overboard exposing them to serious injury or death.



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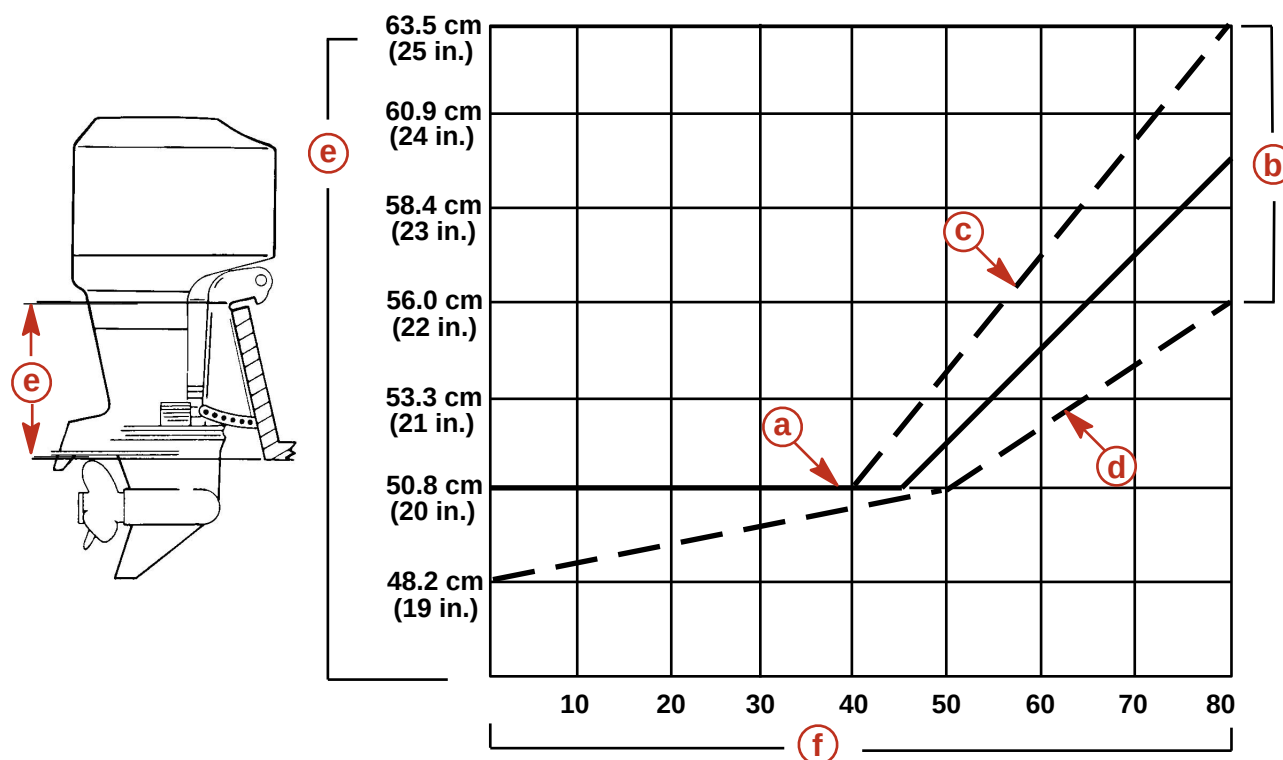
- a** - Special washer head bolt (10-849838)
- b** - Flat washer (2)
- c** - Nylon insert locknut (11-826709113)
- d** - Nylon insert locknut (11-826709113)

Description	Nm	lb. in.	lb. ft.
Special washer head bolt	27		20
Nylon insert locknut "d"	27		20
Nylon insert locknut "c"	Tighten until seats, then back off 1/4 turn		

Assemble steering link rod to steering cable with two flat washers and self-locking nylon insert locknut. Tighten locknut until it seats, then back nut off 1/4 turn.

Assemble steering link rod to engine with special washer head bolt and self-locking nylon insert locknut. First torque bolt, then torque locknut to specifications.

Determining Recommended Outboard Mounting Height



3728

- a** - The solid line is recommended to determine the outboard mounting height.
- b** - The broken lines represent the extremes of known successful outboard mounting height dimensions.
- c** - The line may be preferred to determine outboard mounting height dimension, if maximum speed is the only objective.
- d** - The line may be preferred to determine outboard mounting height dimension for dual outboard installation.
- e** - Outboard mounting height (height of outboard mounting brackets from bottom of boat transom). For heights over 56.0 cm (22 in.) a propeller, that is designed for surfacing operation is usually preferred.
- f** - Maximum boat speed (mph) anticipated.

NOTICE

1. The outboard should be mounted high enough on the transom so that exhaust relief hole will stay at least 25.4 mm (1 in.) above the water line when the engine is running at idle speed. Having the exhaust relief hole above the water line will prevent exhaust restrictions. Exhaust restrictions will result in poor performance at idle.
2. Add 12.7 cm (5 in.) for XL models to the listed outboard mounting heights.
3. The mounting height of the outboard must not exceed 63.5 cm (25 in.) for L models, 76 cm (30 in.) for XL models. Mounting the outboard higher may cause damage to the gearcase components.

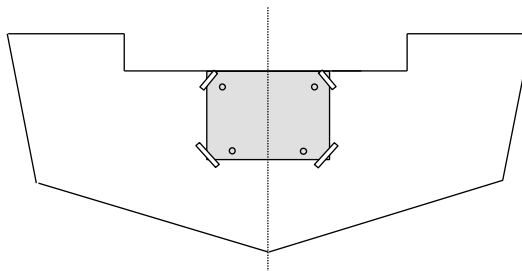
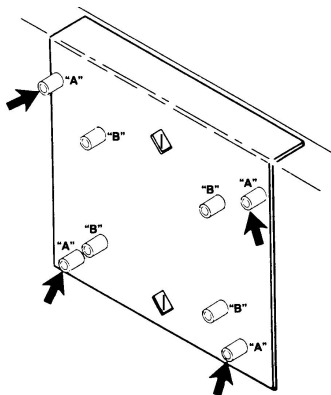
Increasing the mounting height will usually:

- Less steering torque.
- Increase top speed.
- Increase boat stability.
- Cause propeller to break loose during planning.

Drilling Outboard Mounting Holes

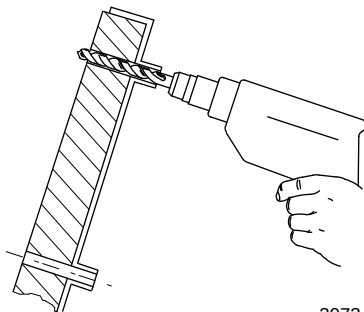
IMPORTANT: Before drilling any mounting holes, carefully read **Determining Recommended Outboard Mounting Height** and install outboard to the nearest recommended mounting height.

1. Use transom drilling fixture or attach (tape) engine mounting template to boat transom.



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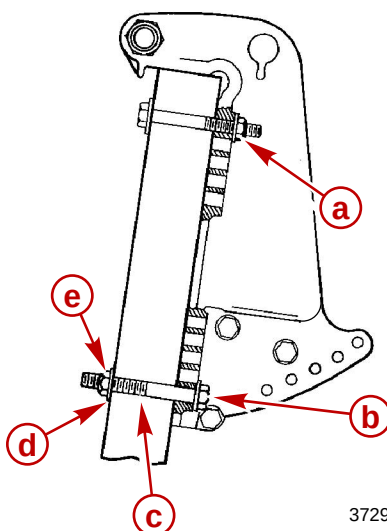
2. Mark and drill four 13.5 mm (17/32 in.) mounting holes.



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3. Apply marine sealer to shanks of bolts, not the threads.

4. Fasten outboard with provided mounting hardware.

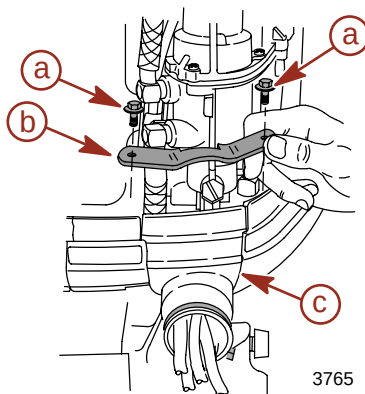


- | | |
|--------------------------------------|----------------------------|
| a - Flat washer (4) | d - Locknut (4) |
| b - 1/2 in. diameter bolt (4) | e - Flat washer (4) |
| c - Shank of bolt | |

Front Clamp Assembly

Removal

Remove two screws with retainer and open the front clamp.

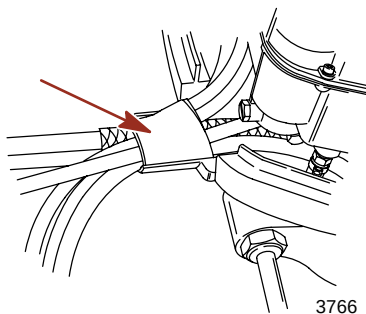


- | | |
|-----------------------|------------------|
| a - Screws (2) | c - Clamp |
| b - Retainer | |

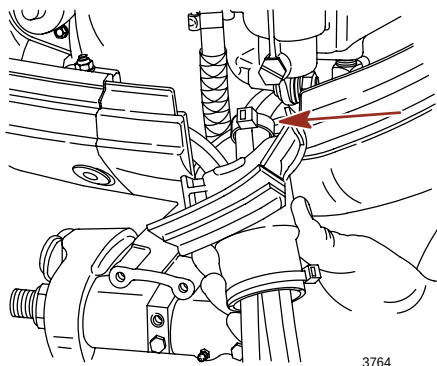
Installation

IMPORTANT: Sufficient slack must exist in engine wiring harness battery cables, fuel hose, and oil hoses between clamp and engine attachment point, to relieve stress and prevent hoses from being kinked or pinched.

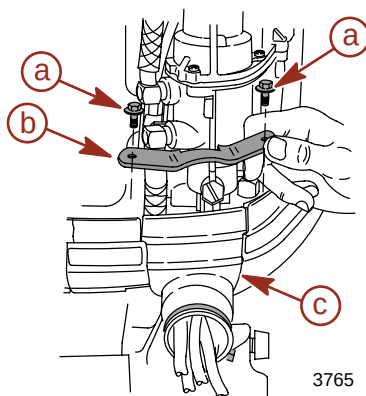
1. Place the neoprene wrap around the wiring, hoses, and control cables.



2. Secure both halves of clamp with cables ties.



3. Secure clamp assembly into bottom cowl with retainer and two screws.



a - Screws (2)
b - Retainer

c - Clamp

Wiring and Installation

Wire Color Code Abbreviations

Wire Color Abbreviations				
BLK	Black		BLU	Blue
BRN	Brown		GRY	Gray
GRN	Green		ORN or ORG	Orange
PNK	Pink		PPL or PUR	Purple
RED	Red		TAN	Tan
WHT	White		YEL	Yellow
LT or LIT	Light		DK or DRK	Dark

Installation Guidelines for DTS System Components

WARNING

To avoid the possibility of serious injury or death from loss of boat control, do not splice or probe into any wire insulation of the DTS system. Splicing or probing will damage the wire insulation allowing water to enter the wiring. Water intrusion may lead to wiring failure and loss of throttle and shift control.

DATA HARNESS

WARNING

To avoid the possibility of serious injury or death from loss on boat control, do not pull on cable connectors when pulling cable into boat. Observe correct pulling procedure. Pulling on connectors can loosen terminals resulting in open or poor electrical connections. Open or poor electrical connections may result in loss of throttle and shift control.

CONNECTORS

IMPORTANT: Connectors should never have to be forced into the receptacle. Ensure that connectors are free of any lubricant or dielectric grease before installation. When the connector is properly aligned, it will only take a small amount of pressure to insert it into the receptacle. Rotate the locking collar to secure the electrical connection.

NOTE: Connect only one data harness of the required length between the engine and helm. If a data harness is too short, do not connect multiple harnesses together to make up the required length. For installations requiring a data harness length longer than 12.2 m (40 ft.), contact Mercury Marine for more information.

Data Harness Pulling Procedure

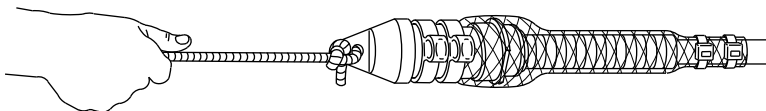
IMPORTANT: Do not route data harness near engine ignition components (coils, spark plug leads, and spark plugs), high power VHF coax or radios. An electrical field generated from these components could cause interference with data transmission.

IMPORTANT: Do not route data harness near sharp edges, hot surfaces or moving parts. Fasten cables away from any sharp edges, fasteners or objects that could wear into the harness.

IMPORTANT: Avoid sharp bends in the data harness. Minimum bend radius should be 7.6 cm (3 in.) for the final wiring installation.

1. Inspect the routing path to make sure surfaces are free of any sharp edges or burrs that could cut the harness.
2. Install cable pulling tool to data harness.
3. Secure pulling tool with 2 cable ties.

IMPORTANT: The cables ties must be tight to prevent any slipping during installation.



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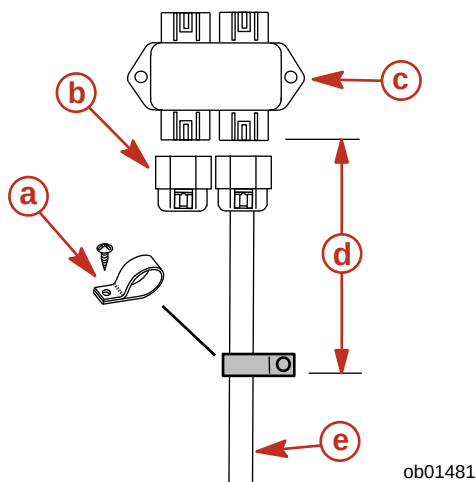
Data Cable Puller	91-888462A1
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IMPORTANT: Carefully inspect data harness pins to ensure all pins are securely fastened to data harness connector end following installation.

NOTE: Data harness should be secured with mounting clips or cable ties along the routing path.

Junction Box (If Equipped)

- Although the junction box connections are watertight, it is recommended that the junction box be mounted in an area that stays relatively dry.
- Mount in an area where the wiring connection will not get stepped on or disturbed.
- Mount in an area that is accessible for troubleshooting and servicing the system.
- Ensure the DTS command module harness will reach all the connection points.
- Fasten all junction box connections within 25.4 cm (10 in.) of the junction box.
- Seal all unused connections with weather caps.



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a - Clamp

b - Weather cap (859318T 2)

c - Junction box

d - 25.4 cm (10 in.)

e - DTS Command Module harness

Non-Mercury Marine Provided Ignition Switch

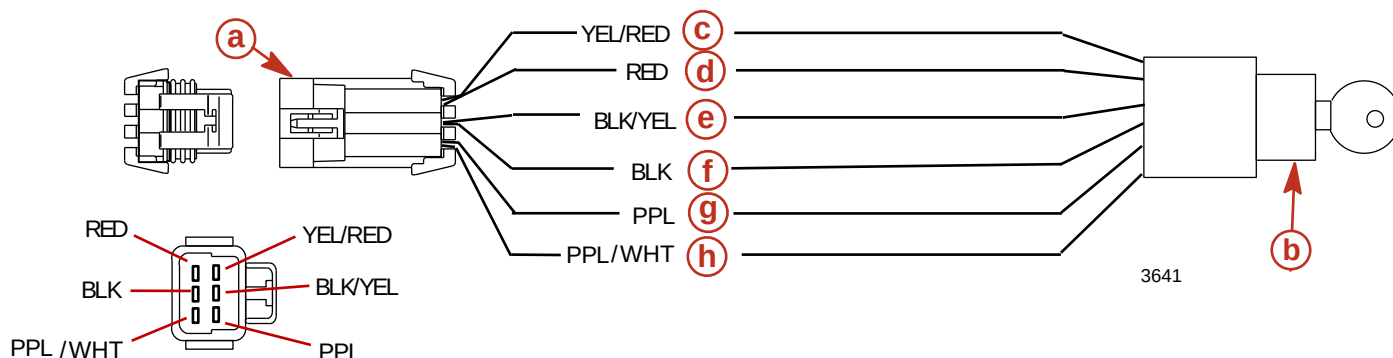
⚠ CAUTION

Prevent unexpected engine start-up. Non-Mercury Marine ignition switches may allow sufficient current leakage to cause engine to start unexpectedly.

IMPORTANT: Correct ignition key switch must be used. If a non-Mercury Marine ignition key switch is being used, make sure that the ignition switch being used meets the requirement listed.

IMPORTANT: Current leakage exceeding 5 mA at 12 volts could cause engine to start unexpectedly.

- Ignition key switch must pass ingress protection testing per IEC IP66 specification minimum. Switches that do not pass this specification could leak current.
- Switches must contain an emergency stop circuit.



4 Position Key Switch

- | | |
|---|--|
| a - Connector - Packard Metripack 150 Series Sealed™ (6 pin) | e - Lanyard stop |
| b - Ignition switch | f - Ground |
| c - Crank | g - Run |
| d - + 12V | h - Accessory - 4 position key switch |

Wiring Accessories

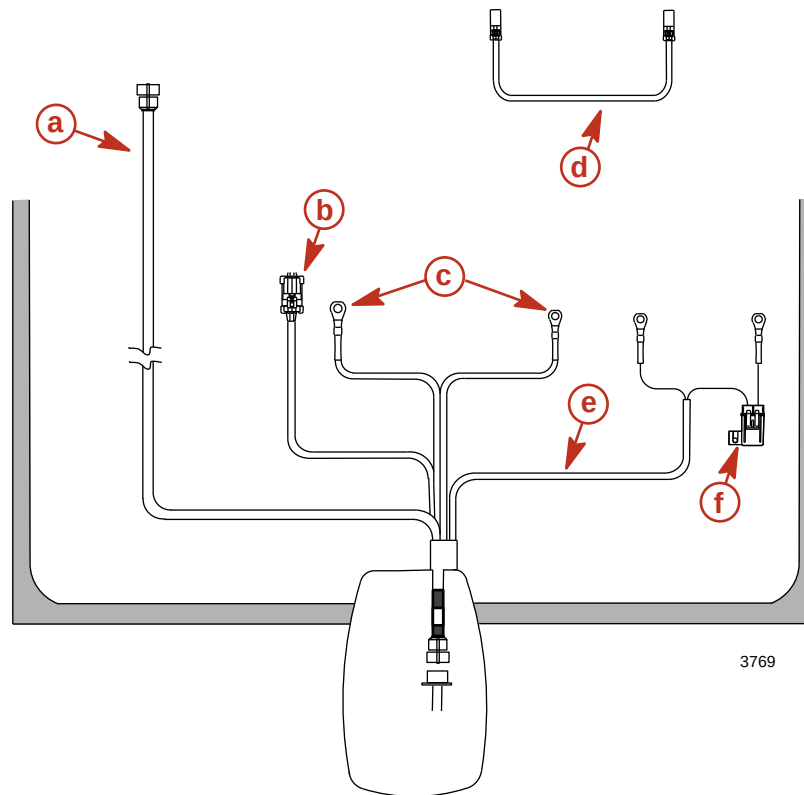
NOTE: Refer to *Mercury Precision Parts Accessories Guide*.

System Wiring Reference Points

FEATURES

- **DTS power harness** - Provides 12V power to the DTS system. Requires connection to the starting battery. If starting battery is located at the helm, DTS power harness accessory kit is required to minimize voltage drop. Use cable ties to secure power harness leads to battery cables, within 15 cm (6 in.) of battery posts.
- **Battery cables** - Connect to the starting battery.
- **Vessel sensor harness** - This harness connects to the fuel tank sensor, remote oil tank sensor and the paddle wheel speed/temperature sensor, if equipped.
- **14 pin data harness** - Connects between the command module harness and engine.

- **Control Area Network (CAN) link harness** - Must be installed between command module harness for dual engine installation.



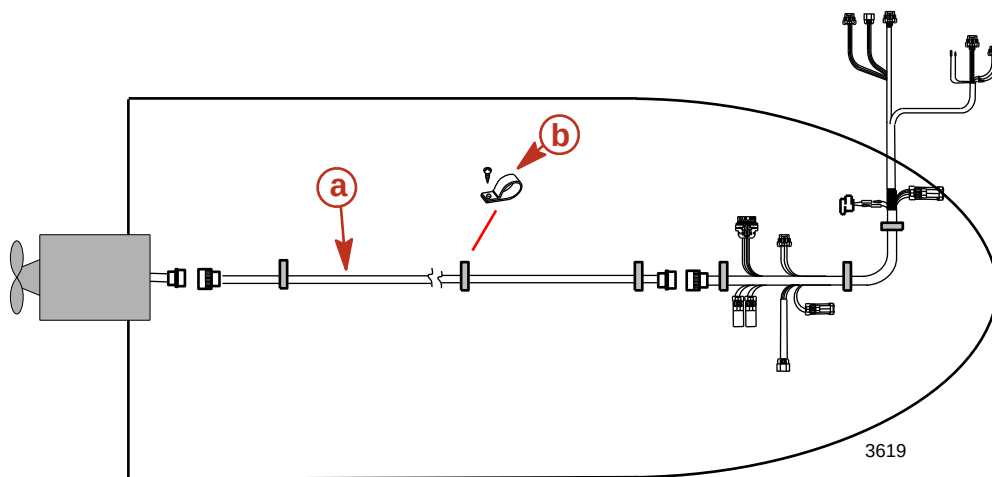
a - 14 pin data harness
b - Vessel sensor harness
c - Battery cables

d - CAN link harness (dual engine application)
e - DTS power harness
f - 5 Amp fuse

Connecting 14 Pin Data Harness - Single Engine

SINGLE HELM

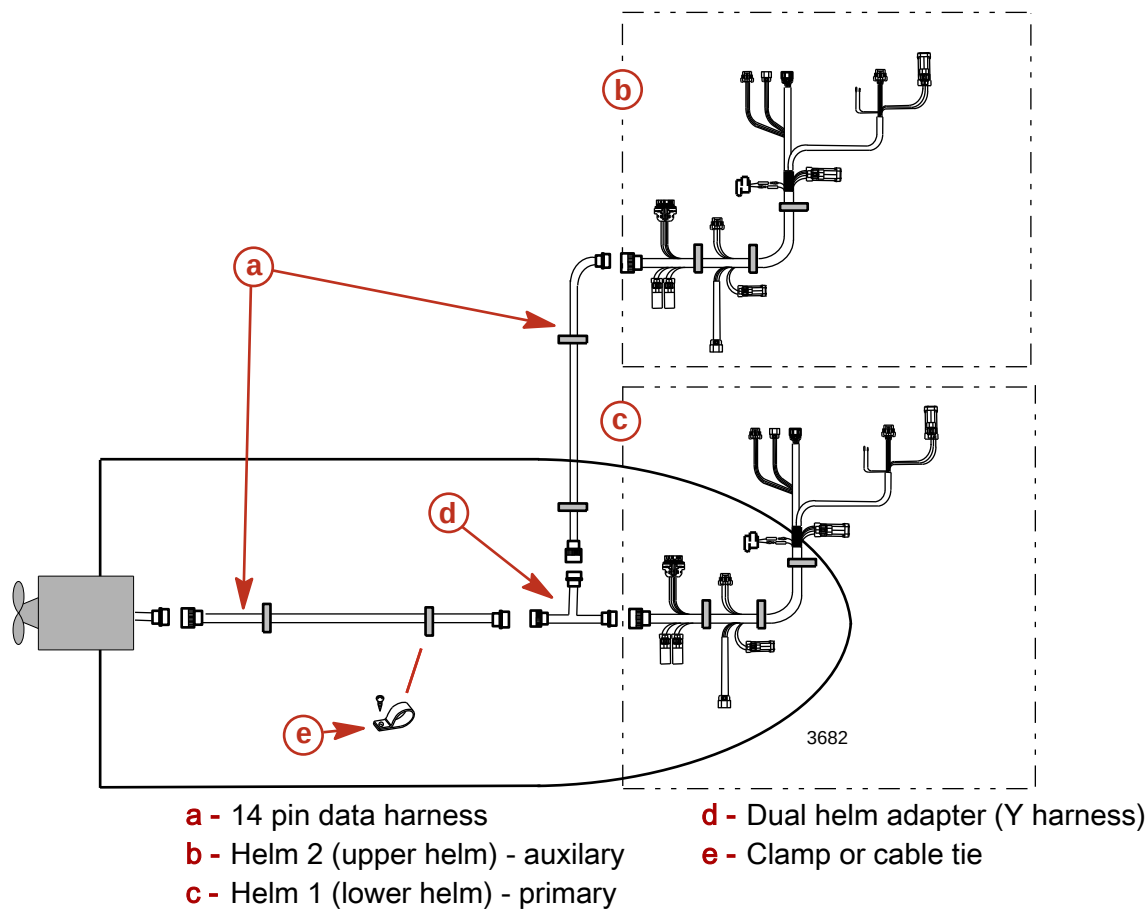
IMPORTANT: Avoid sharp bends in the harness. Minimum bend radius should be 7.6 cm (3 in.).



a - 14 pin data harness

b - Clamp or cable tie

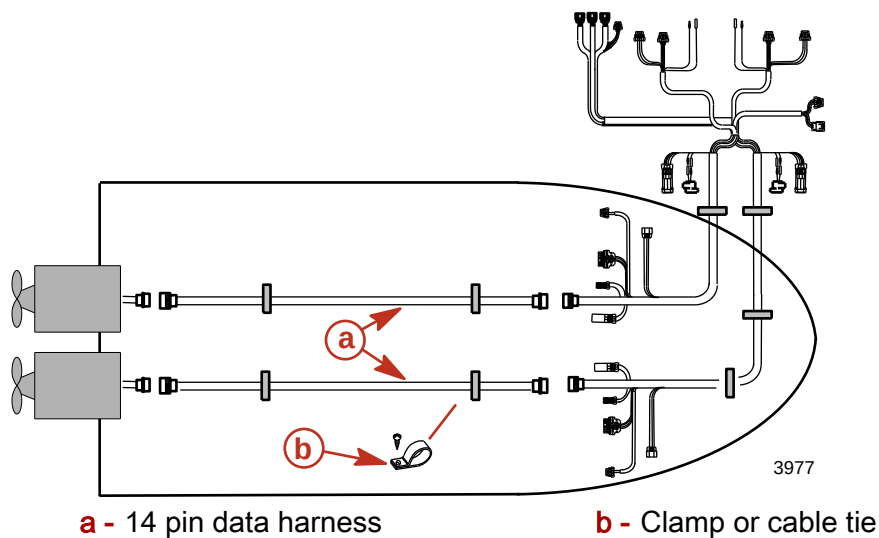
DUAL HELM



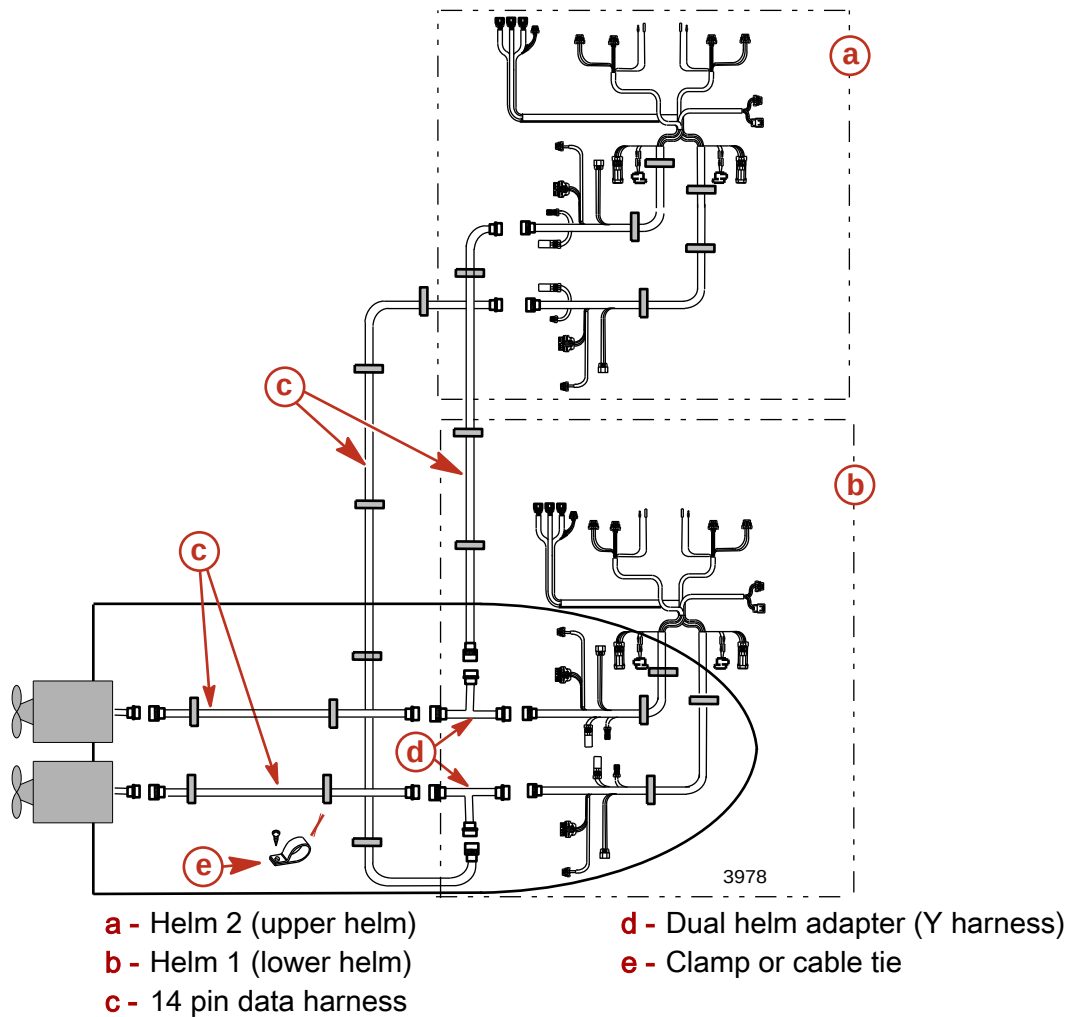
Connecting 14 Pin Data Harness - Dual Engine

SINGLE HELM

IMPORTANT: Avoid sharp bends in the harness. Minimum bend radius should be 7.6 cm (3 in.).



DUAL HELM

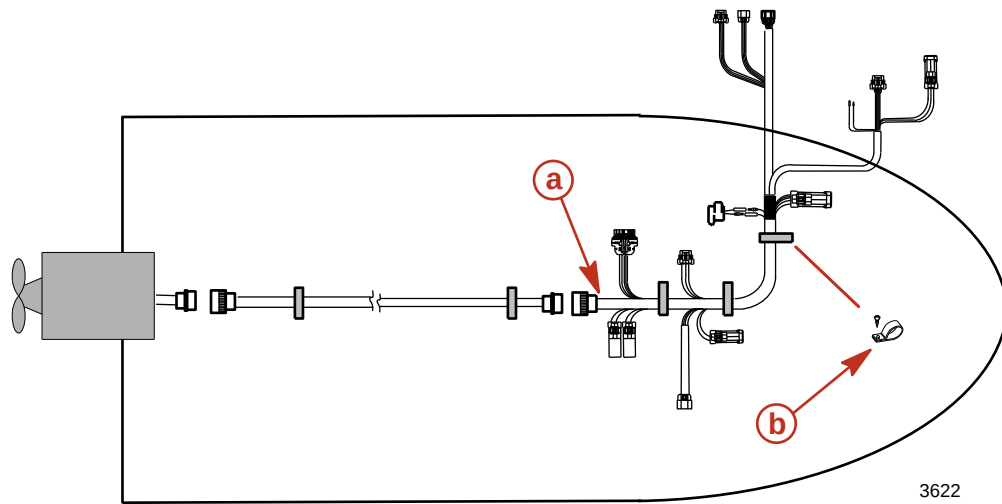


Installing DTS Command Module and Harness - Single Engine

HARNESS INSTALLATION

- Locate a routing path for the harness connections so they reach their installation points.
- Inspect the routing path to make sure surfaces are free of any sharp edges or burrs that could cut the harness.
- Fasten and support the harness with clamps or cable ties along the routing path.

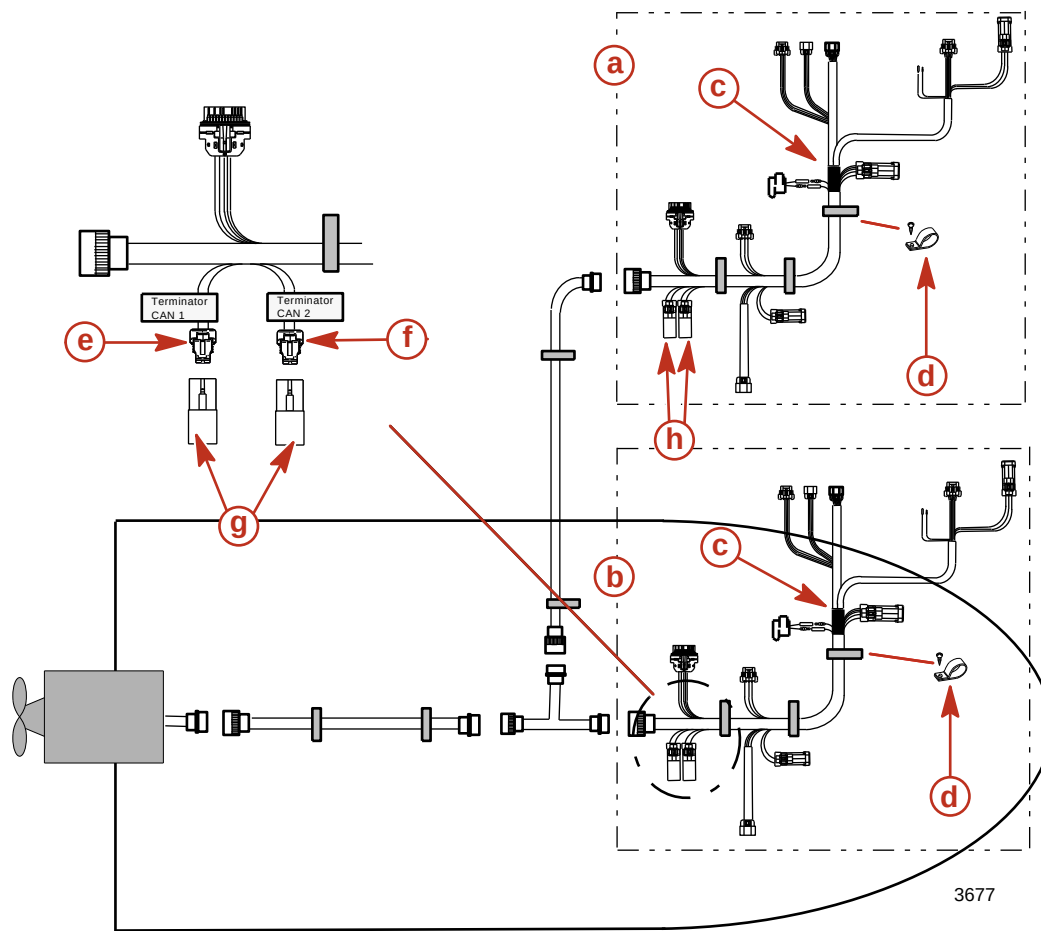
- Make sure all connections are tight and seal all unused connectors with weather caps.



Single Helm Application

a - DTS command module harness **b** - Clamp or cable tie

NOTE: For dual helm application - Remove CAN 1 and CAN 2 terminator resistors from helm 1 (helm closest to the engine), and seal connectors with weather caps.



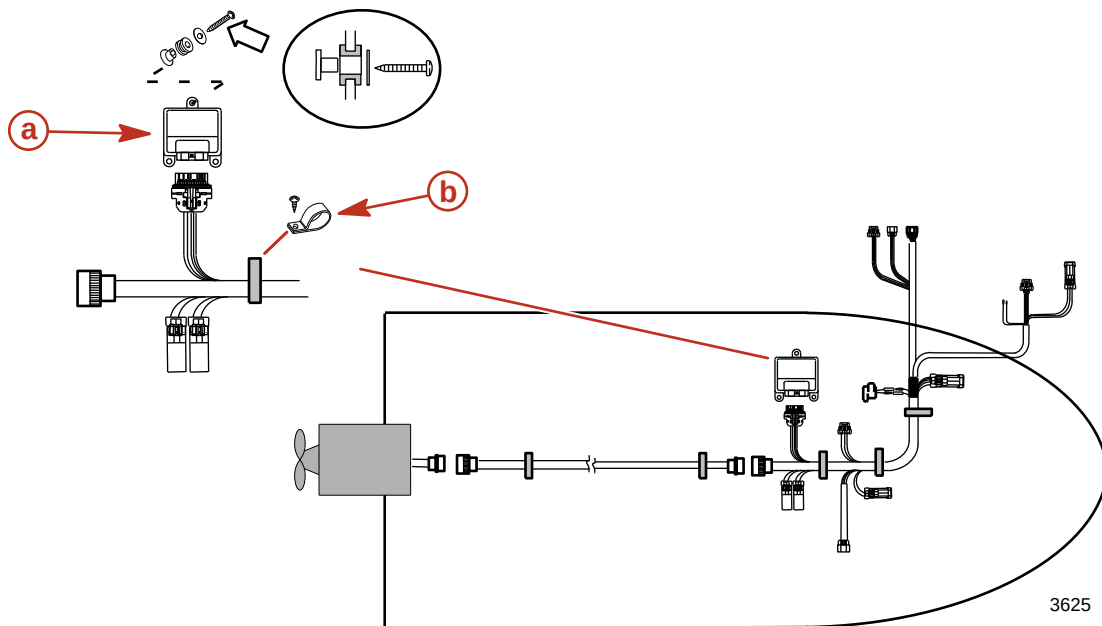
Dual Helm Application

- | | |
|---------------------------------------|---|
| a - Helm 2 (upper helm) | e - CAN 1 connector |
| b - Helm 1 (lower helm) | f - CAN 2 connector |
| c - DTS command module harness | g - Weather caps |
| d - Clamp or cable tie | h - Terminator resistors, blue (CAN1 & CAN2) |

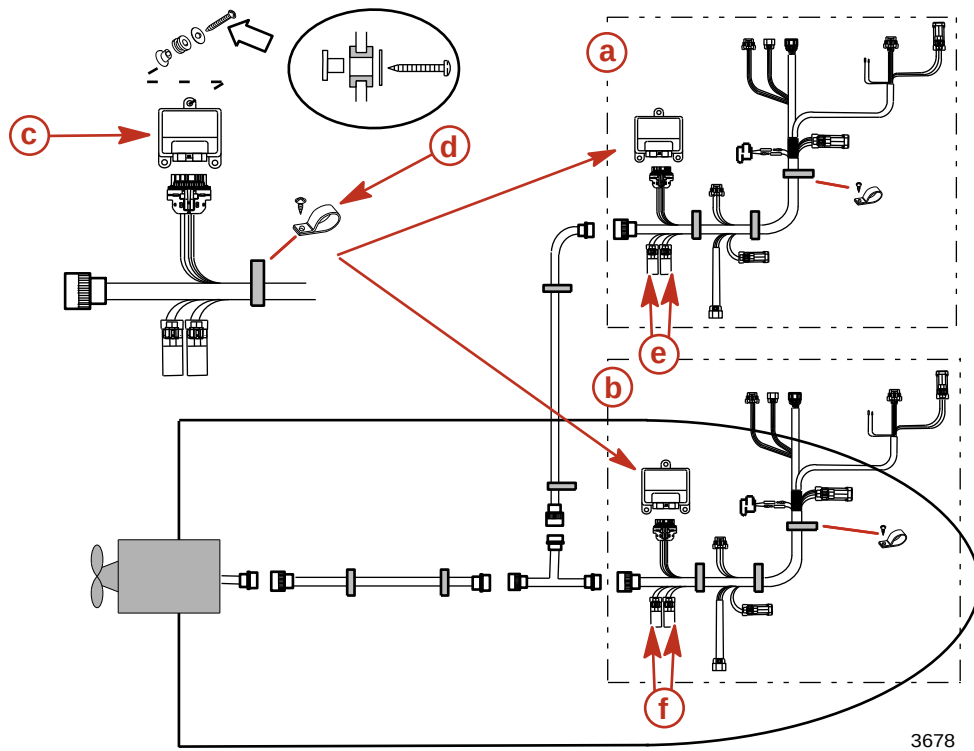
MODULE INSTALLATION

- Although the Command Module connection is watertight, it is recommended that it be mounted in an area that stays relatively dry.
- Mount in an area where the wiring connection will not get stepped on or disturbed.
- Mount in an area that is accessible for troubleshooting and servicing the system.

- Ensure the wiring harness connected to the command module will reach all the connection points.



Single Helm Application

a - DTS command module**b** - Clamp or cable tie

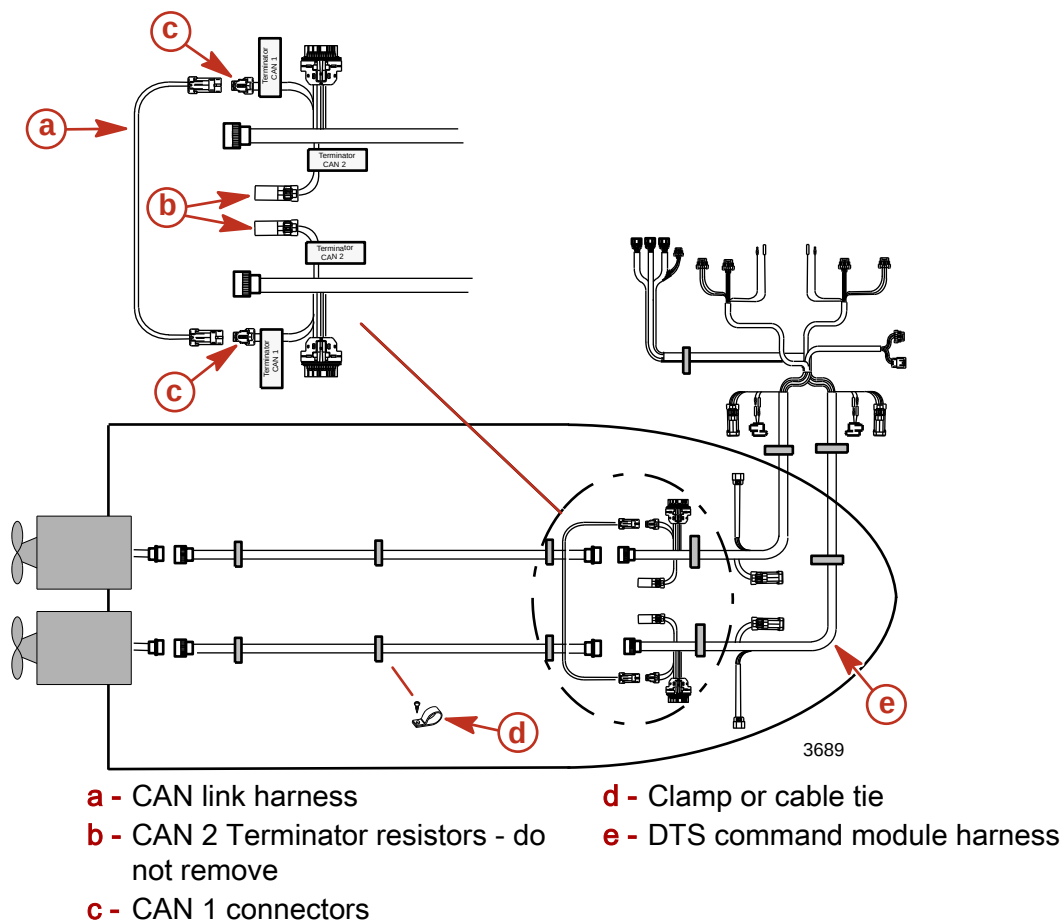
Dual Helm Application

a - Helm 2**b** - Helm 1**c** - DTS command module**d** - Clamp or cable tie**e** - Terminator resistors, blue (CAN1 & CAN2)**f** - Weather caps

Installing DTS Command Module and Harness - Dual Engine/Single Helm

HARNESS INSTALLATION

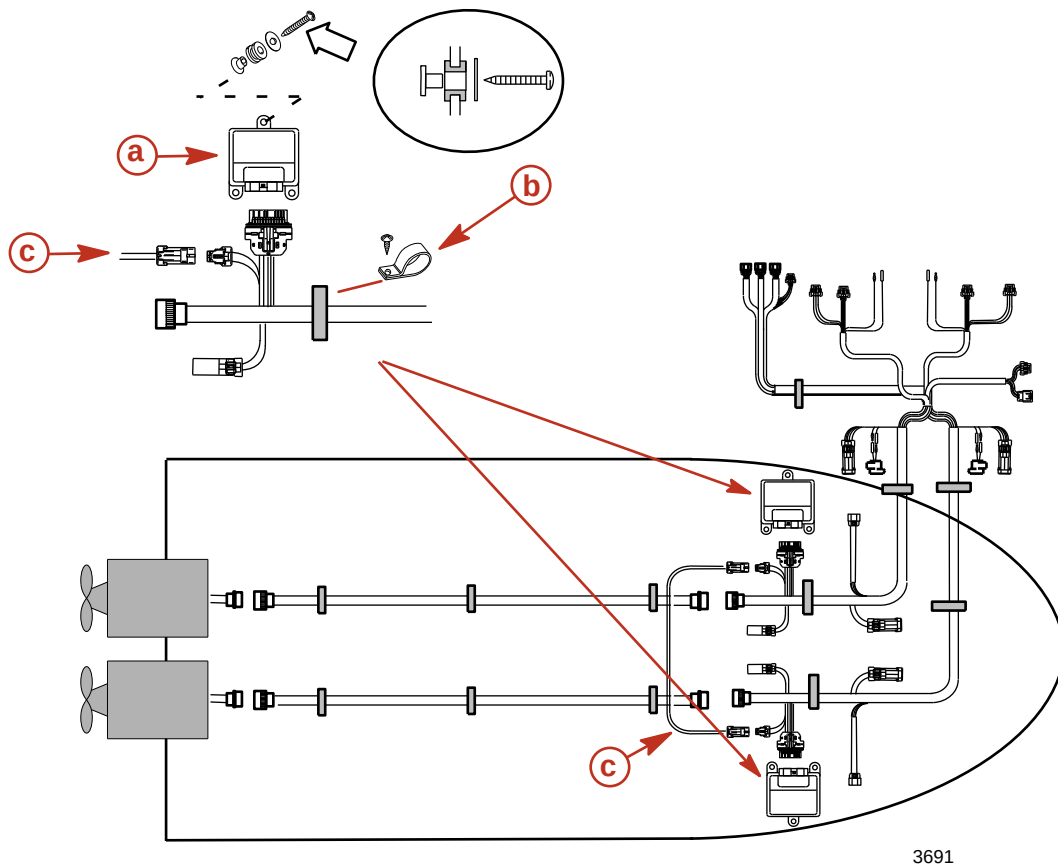
- Locate a routing path for the harness connections so they reach their installation points.
- Inspect the routing path to make sure surfaces are free of any sharp edges or burrs that could cut the harness.
- Fasten and support the harness with clamps or cable ties along the routing path.
- Make sure all connections are tight and seal all unused connectors with weather caps.



MODULE INSTALLATION

- Although the Command Module connection is watertight, it is recommended that it be mounted in an area that stays relatively dry.
- Mount in an area where the wiring connection will not get stepped on or disturbed.
- Mount in an area that is accessible for troubleshooting and servicing the system.

- Ensure the wiring harness connected to the command module will reach all the connection points.



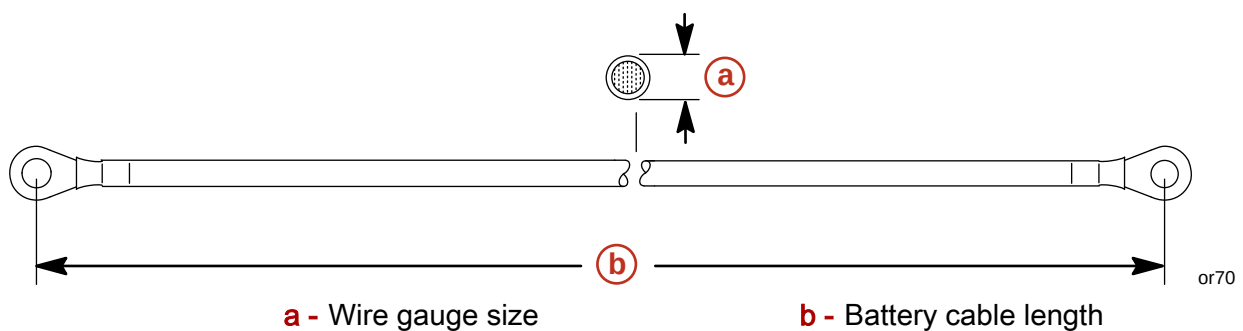
a - DTS command module
b - Clamp or cable tie

c - CAN link harness

Battery Cable Size For Outboard Models

IMPORTANT: Only use copper battery cables. Do not use aluminum cables for any outboard marine installations.

- If longer battery cables are required, the wire gauge size must increase. See chart following for correct wire gauge size.
- DTS L models are equipped with 3.7 m (12 ft.) cables. DTS XL and XXL models are not shipped with battery cables.



Copper Battery Cable Wire Gauge Size					
Wire Gauge Size Number SAE					
Models		6-25 hp	30-115 hp (except OptiMax)	125-250 hp (except OptiMax)	OptiMax/Verado
Cable Length	2.4 m (8 ft.)	8 ¹ .	6 ¹ .	-	-
	2.7 m (9 ft.)	6	4	-	-
	3.0 m (10 ft.)	6	4	6 ¹ .	-
	3.4 m (11 ft.)	6	4	4	-
	3.7 m (12 ft.)	6	4	4	4 ¹ .
	4.0 m (13 ft.)	6	2	4	2
	4.3 m (14 ft.)	4	2	4	2
	4.6 m (15 ft.)	4	2	4	2
	4.9 m (16 ft.)	4	2	2	2
	5.2 m (17 ft.)	4	2	2	2
	5.5 m (18 ft.)	4	2	2	2
	5.8 m (19 ft.)	4	2	2	2
	6.1 m (20 ft.)	4	2	2	2
	6.4 m (21 ft.)	2	1	2	1
	6.7 m (22 ft.)	2	1	2	1
	7.0 m (23 ft.)	2	1	2	1
	7.3 m (24 ft.)	2	1	2	1
	7.6 m (25 ft.)	2	1	2	1
	7.9 m (26 ft.)	2	1/0	1	1/0
	8.2 m (27 ft.)	2	1/0	1	1/0
	8.5 m (28 ft.)	2	1/0	1	1/0
	8.8 m (29 ft.)	2	1/0	1	1/0
	9.1 m (30 ft.)	2	1/0	1	1/0
	9.4 m (31 ft.)	2	1/0	1	1/0
	9.8 m (32 ft.)	2	1/0	1	1/0
	10.1 m (33 ft.)	2	2/0	1/0	2/0
	10.4 m (34 ft.)	2	2/0	1/0	2/0
	10.7 m (35 ft.)	1	2/0	1/0	2/0
	11.0 m (36 ft.)	1	2/0	1/0	2/0
	11.3 m (37 ft.)	1	2/0	1/0	2/0
	11.6 m (38 ft.)	1	2/0	1/0	2/0
	11.9 m (39 ft.)	1	2/0	1/0	2/0
	12.2 m (40 ft.)	1	2/0	1/0	2/0

1. Standard (original) cable length and wire gauge size.

Battery Information

⚠ CAUTION

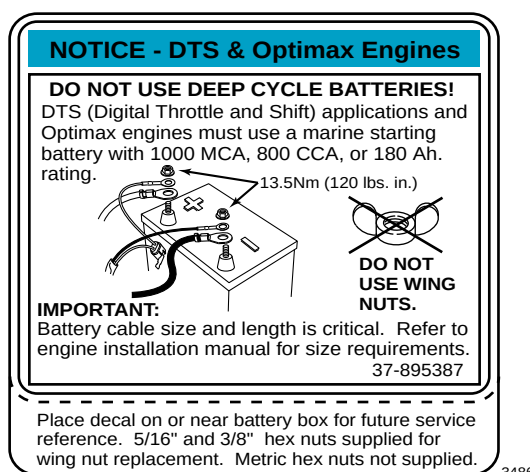
Hex nuts must be used to secure battery leads to battery posts to avoid loss of electrical power.

- Do not use deep cycle batteries. Engines must use a marine starting battery with 1000 MCA, 800 CCA or 180 Ah.
- When connecting engine battery, hex nuts must be used to secure battery leads to battery posts. Torque nuts to specification.

Description	Nm	lb. in.	lb. ft.
Hex nuts	13.5	120	

IMPORTANT: Battery cable size and length is critical. Refer to engine installation manual for size requirements.

Decal needs to be placed on or near battery box for future service reference. One 5/16 in. and one 3/8 in. hex nut are supplied per battery for wing nut replacement. Metric hex nuts are not supplied.



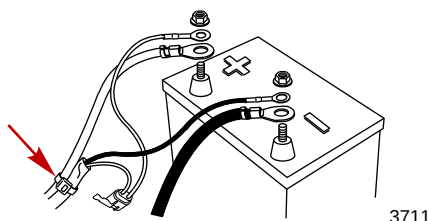
3486

Connecting Battery Cables and DTS Power Harness

⚠ CAUTION

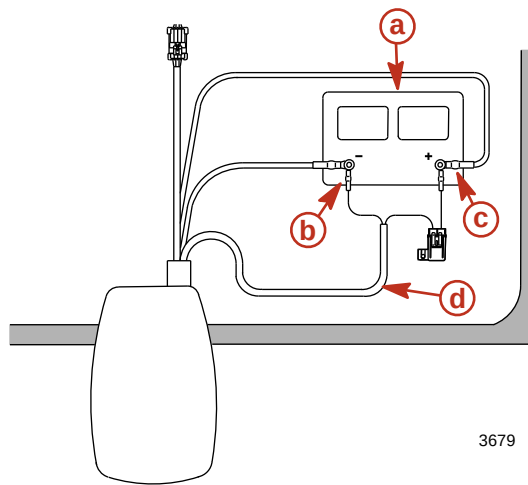
To avoid the possibility of loss of electrical power due to the DTS power harness connection being pulled off battery, fasten the DTS power harness to one of the battery cables near the battery with cable tie.

- Install DTS power harness directly to the starting battery only.
- Do not extend lead length of harness.
- See accessory manual for optional lead connection kit.

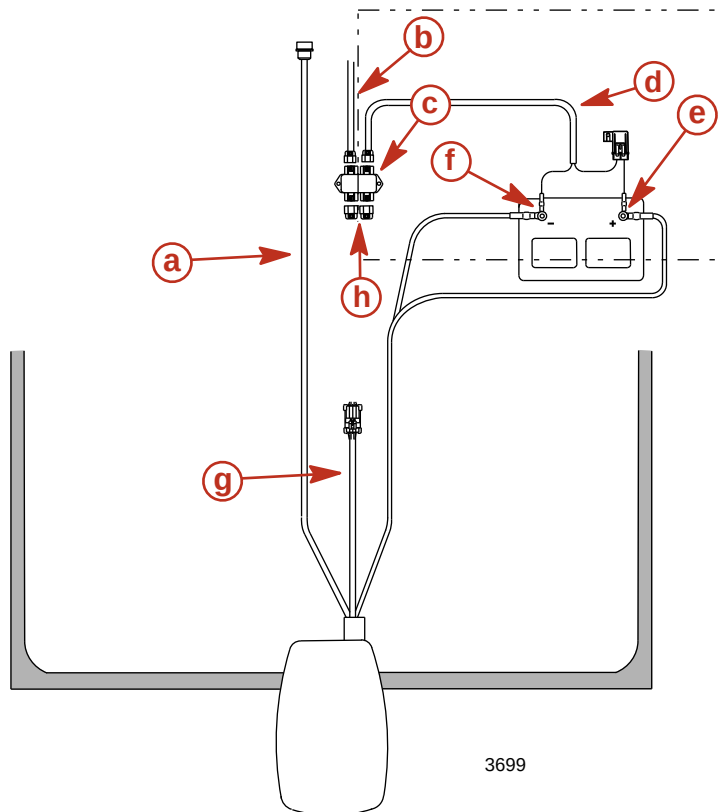


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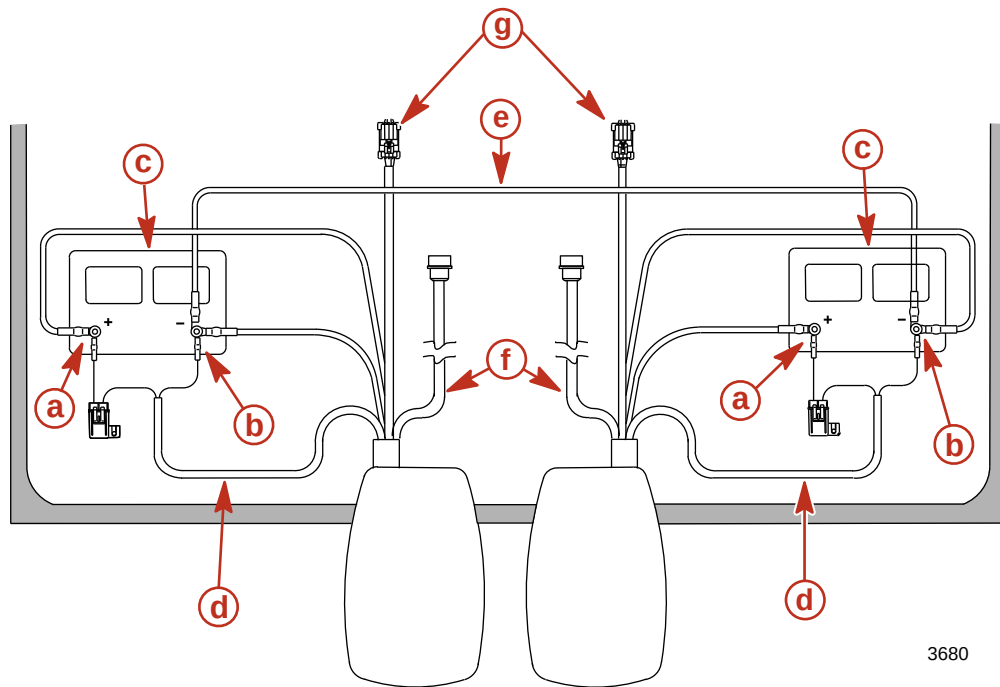
SINGLE ENGINE - BATTERY AT STERN

**a** - Battery**b** - Black sleeve (negative)**c** - Red sleeve (positive)**d** - DTS power harness (provided)

SINGLE ENGINE - BATTERY AT HELM

**a** - 14 pin data harness**b** - DTS command module harness**c** - Junction box**d** - DTS power harness (optional)**e** - Red sleeve (Positive)**f** - Black sleeve (Negative)**g** - Vessel sensor harness**h** - Weather caps

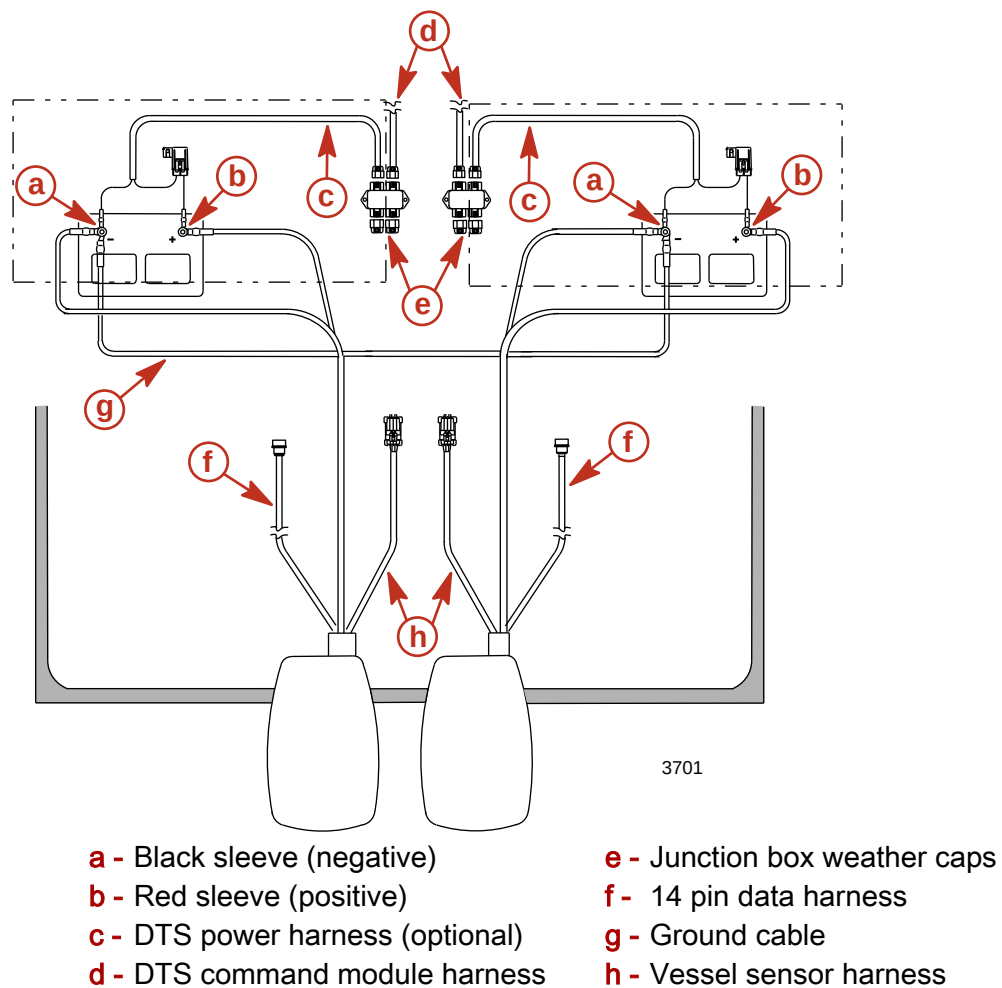
DUAL ENGINE - BATTERY AT STERN



- a** - Red sleeve (positive)
- b** - Black sleeve (negative)
- c** - Battery
- d** - DTS power harness (provided)

- e** - Ground cable
- f** - Data cable
- g** - Vessel sensor harness

DUAL ENGINE - BATTERY AT HELM

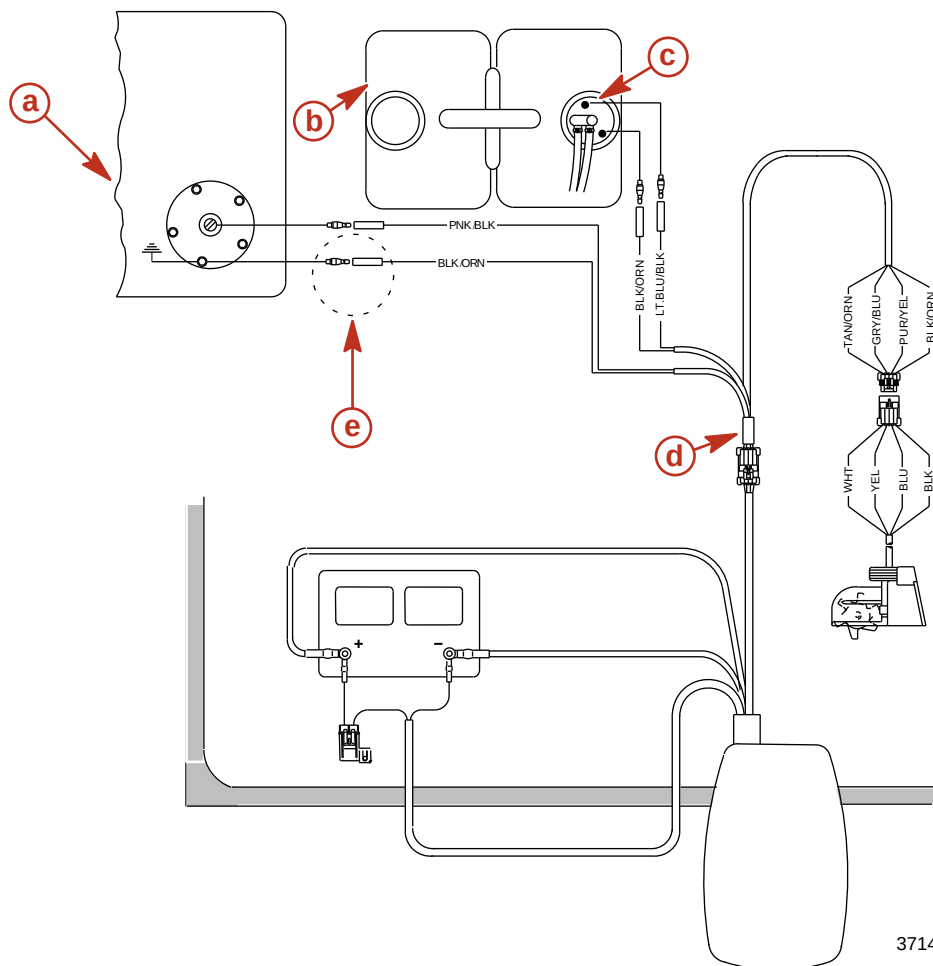


Connecting Fuel Tank, Oil Tank and Speed Sensor

IMPORTANT: Do not connect the blk/orn wire, if equipped, to the fuel tank sensor when there is an engine battery ground strap connected to the fuel tank or sender assembly. If not used, plug the unused open bullet connector with rubber plug.

IMPORTANT: If fuel tank is plastic and fuel sensor mounting plate is not connected to battery ground, connect blk/orn wire, if equipped, to fuel sender mounting plate.

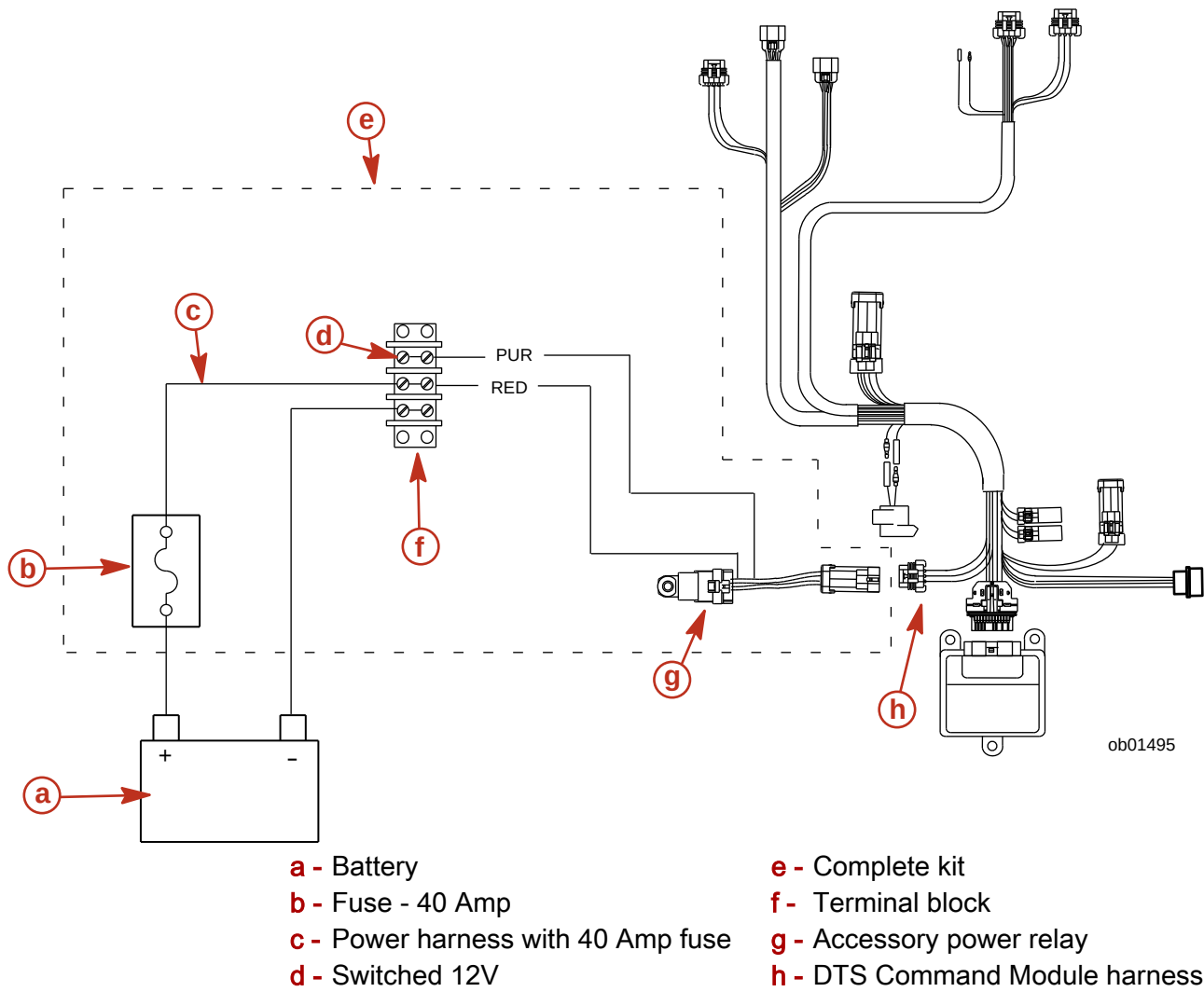
IMPORTANT: Metal fuel tanks must be grounded to hull or battery ground in accordance to coast guard regulations.



- a** - Fuel tank
- b** - Oil tank
- c** - Oil tank sender

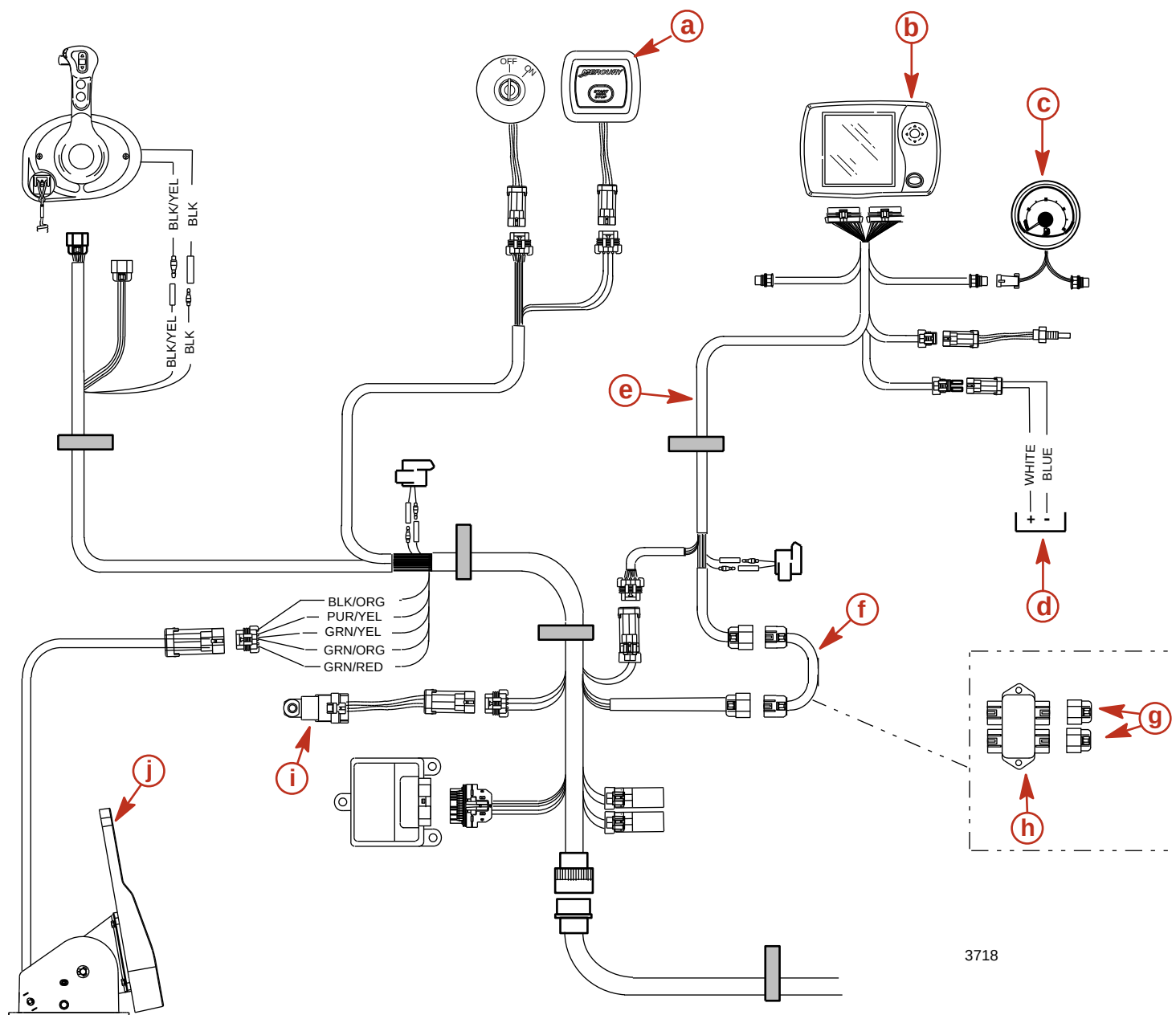
- d** - Harness
- e** - Black/orange wire to fuel tank sensor, if equipped

Switched 12V Accessory Connection



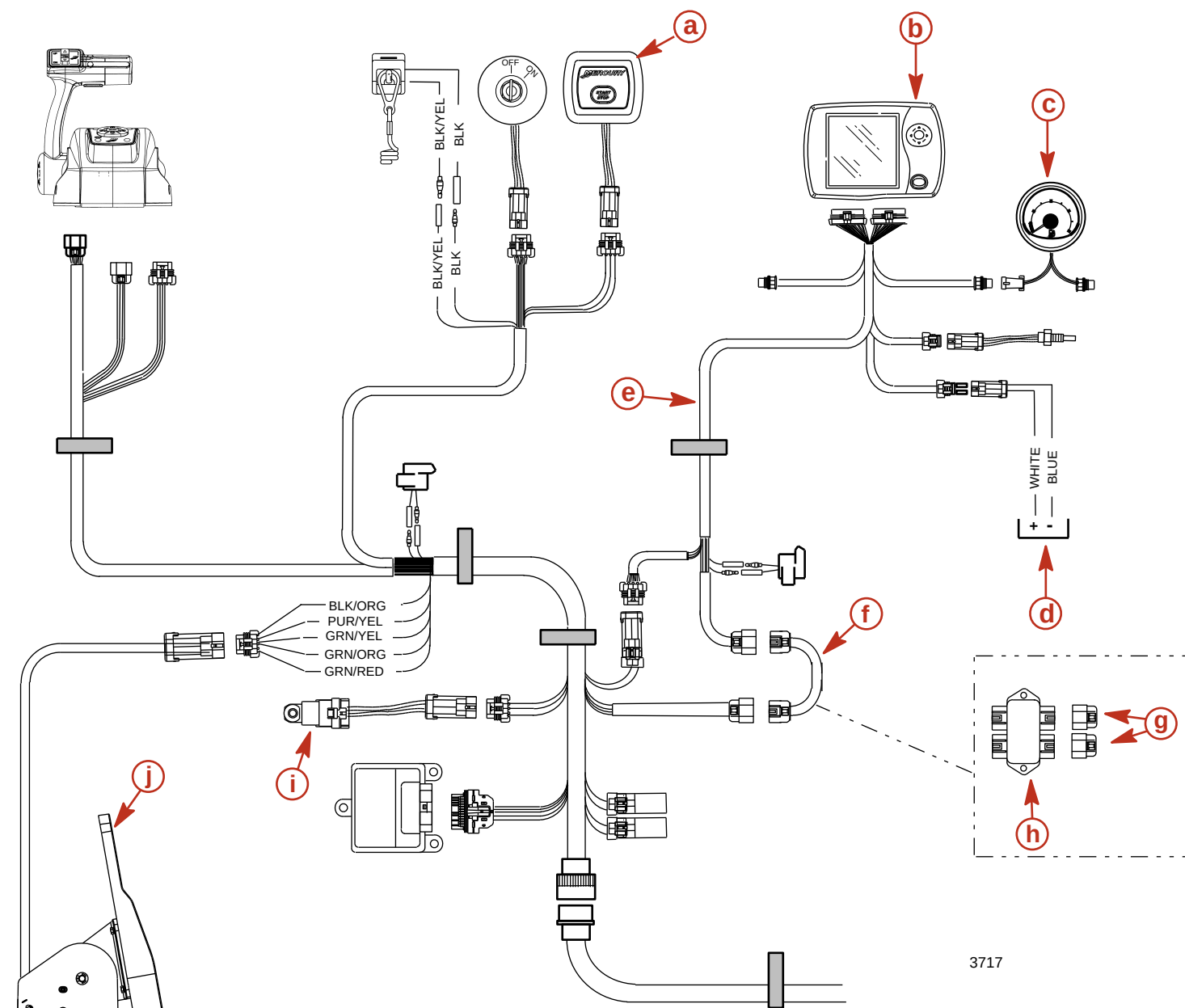
DTS Wiring - Single Engine

PANEL CONTROL



- | | |
|--|---|
| a - Start/stop switch (optional) | f - Cable adaptor (male to female) |
| b - SmartCraft System View (optional) | g - Weather caps |
| c - SmartCraft Link Gauge (optional) | h - Junction box (optional) |
| d - GPS connection | i - Accessory power relay (optional) |
| e - Displace harness | j - Foot throttle (optional) |

CONSOLE CONTROL

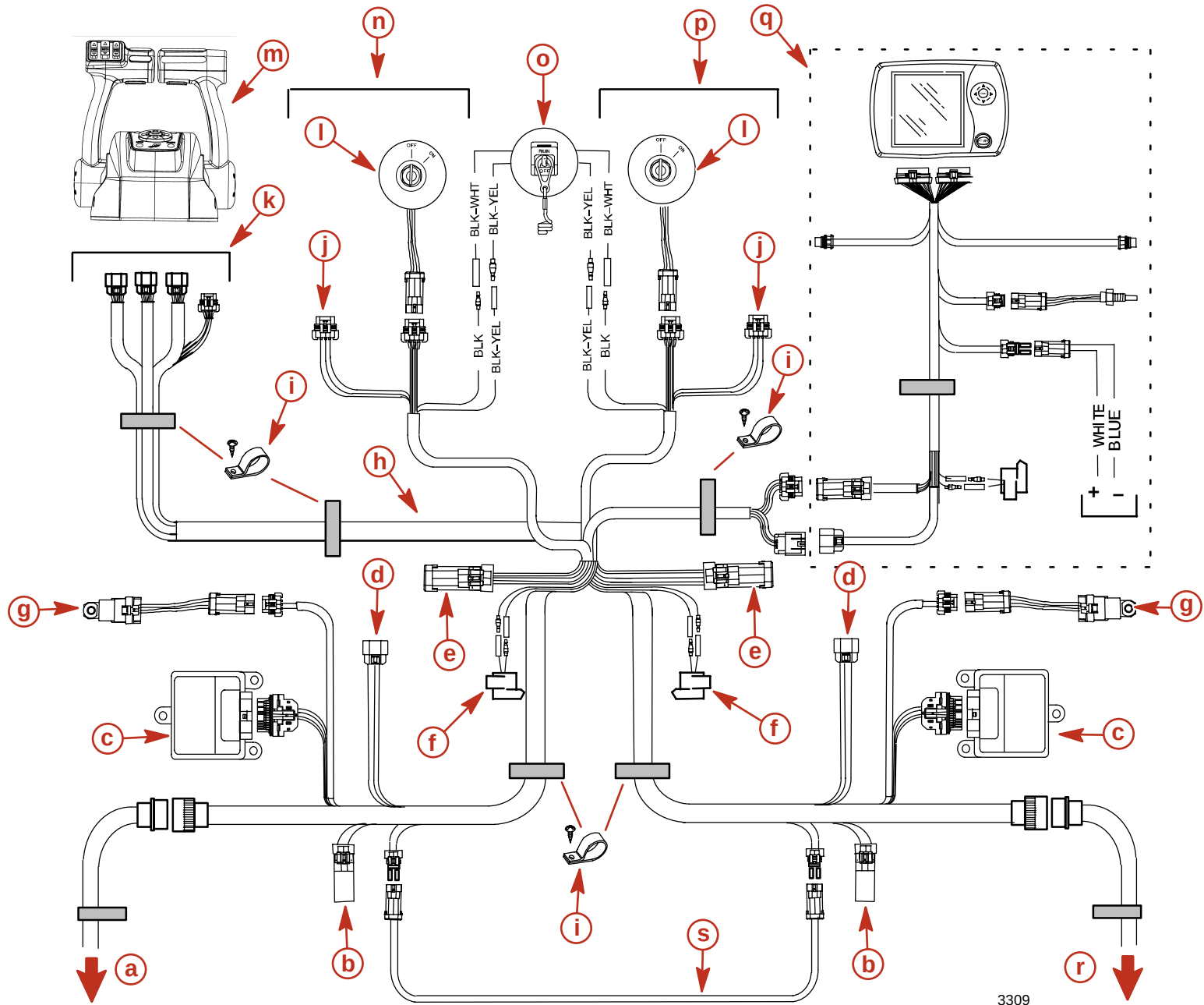


- a** - Start/stop switch (optional)
- b** - SmartCraft System View (optional)
- c** - SmartCraft Link Gauge (optional)
- d** - GPS connection
- e** - Display harness

- f** - Cable adaptor (male to female)
- g** - Weather caps
- h** - Junction box
- i** - Accessory power relay (optional)
- j** - Foot throttle (optional)

DTS Wiring - Dual Engine

CONSOLE CONTROL



3309

- | | |
|---|---------------------------------------|
| a - To port engine | k - Remote control connections |
| b - Terminator resistor | l - Key switch |
| c - DTS Command Module | m - Remote control |
| d - Junction box connection (optional) | n - To port engine |
| e - Connector - Zero Effort controls | o - Lanyard stop switch |
| f - Horn | p - To starboard engine |
| g - Accessory power relay (optional) | q - System View (optional) |
| h - DTS Command Module harness | r - To starboard engine |
| i - Clamp | s - CAN link harness |
| j - Connector - stop/start switch (optional) | |

System Wiring Installation Checklist

DATA CABLE

- ☐ Verify the data harness is not routed near sharp edges, hot surfaces or moving parts.
- ☐ Verify data harness is not routed near ignition components (coils, spark plug leads, and spark plugs), high power VHF coax or radios.

JUNCTION BOX (IF EQUIPPED)

- ☐ Verify the data harness is not routed near sharp edges, hot surfaces or moving parts.
- ☐ Ensure the harness connections are fastened within 25.4 cm (10 in.) of the junction box.
- ☐ Verify that all unused receptacles are covered with a weather cap.

NON-MERCURY MARINE SUPPLIED IGNITION KEY SWITCH

- ☐ If a non-Mercury Marine ignition key is used, verify that it passes the ingress protection testing per IEC IP66 specification minimum. Ignition switches must pass this specification.

ELECTRONIC REMOTE CONTROL

- ☐ Ensure Electronic Remote Control (ERC) connections are completed following ERC installation instructions prior to engine operation.

DTS COMMAND MODULE HARNESS

- ☐ Verify that all connectors are properly inserted and locked in their receptacle (remote control, key switch, command module, lanyard stop switch and junction box, if equipped).
- ☐ Verify that while moving the remote control handle (full forward and full reverse) the harness has unobstructed movement (moves freely).
- ☐ Verify that the lanyard stop switch is wired into the system correctly.
- ☐ Verify that the harness is fastened along the routing path.
- ☐ Verify that all unused connectors have weather caps to prevent corrosion.

BATTERY

- ☐ Verify that wing nuts have been replaced with hex nuts, provided.
- ☐ Verify that all engine battery cables are connected to the correct terminals.
- ☐ Verify that the DTS power harness leads are connected to the starting battery and secured with locknuts.
- ☐ Ensure the 5 Amp fuse for the DTS power harness is accessible.

LANYARD STOP SWITCH

- ☐ Verify that the switch is installed.
- ☐ Verify that the switch is connected to the DTS command module harness.

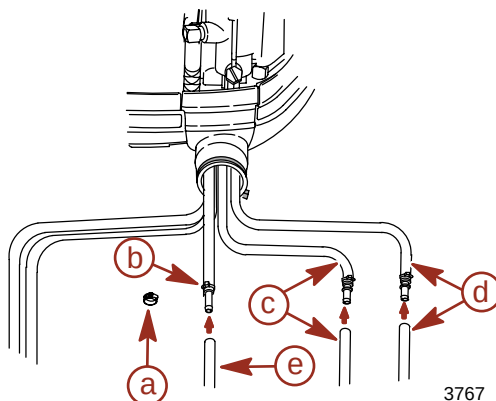
Fuel Hose and Oil Hose Connections

Fuel Hose Connection

Fuel Hose Size - Minimum fuel line inside diameter (I.D.) is 8mm (5/16 in.), with separate fuel line/fuel tank pickup for each engine.

1. Fasten remote fuel hose to fitting with hose clamp.

2. Connect the remote oil hoses to the engine hose connections. Fasten hose connections with cable ties.

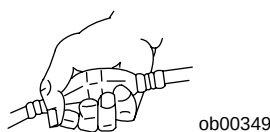


- a** - Hose clamp
b - Cable tie
c - Oil hose without blue stripe
d - Oil hose with blue stripe
e - Remote fuel hose

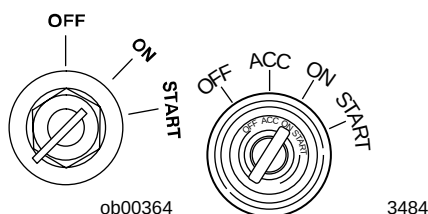
Filling the Fuel System

When starting an engine for the first time, or starting an engine that ran out of fuel or was drained of fuel, fill and prime the fuel system.

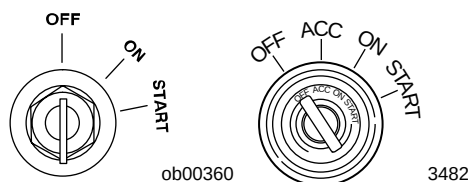
1. Squeeze the fuel line primer bulb until it feels firm.



2. Turn the key switch to the "ON" position for three seconds. This operates the electric fuel pump.



3. Turn the key switch back to the "OFF" position and squeeze the primer bulb again until it feels firm.

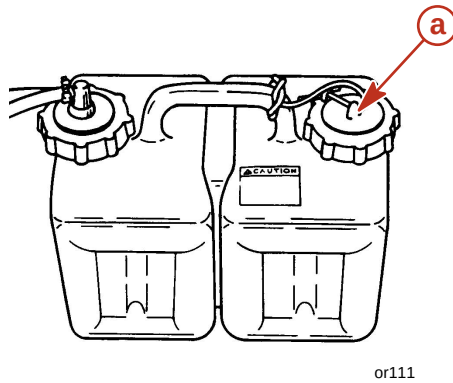


4. Turn the key switch to the "ON" position again for three seconds.
5. Continue this procedure until the fuel line primer bulb stays firm.

Filling the Oil System

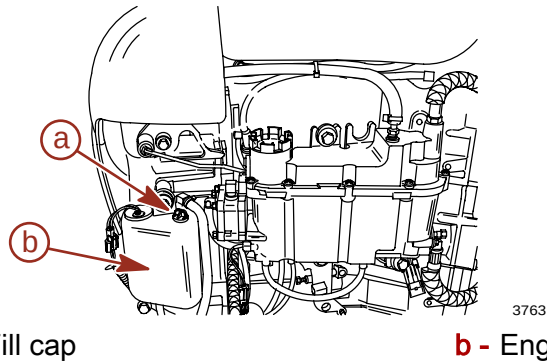
1. Fill the remote oil tank with the recommended oil listed in the **Operation and Maintenance Manual**.

2. Tighten the fill cap.



a - Fill cap

3. Remove the cap and fill the engine oil tank with oil.



a - Fill cap

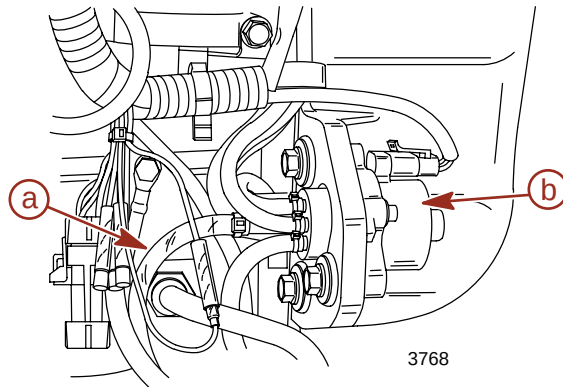
b - Engine oil tank

4. Reinstall the fill cap.

Priming Oil Injection Pump

IMPORTANT: DTS helm configuration must be completed before performing the following procedure.

Before starting the engine for the first time, prime the oil injection pump. Priming will remove any air that may be in the pump, oil supply hose or internal passages.



a - Oil supply hose

b - Oil injection pump

⚠ CAUTION

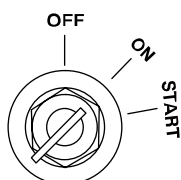
Avoid fuel pump damage. Always fill the engine fuel system with fuel before priming the oil injection pump. Otherwise, the fuel pump will run without fuel during the priming process.

1. Fill the fuel system.
 - a. Connect fuel hose.
 - b. Fill the fuel system by squeezing the primer bulb.
 - c. Squeeze the fuel line primer bulb until it feels firm.

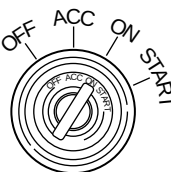


ob00349

- d. Turn the ignition key switch to the "ON" position for three seconds. This operates the electric fuel pump.

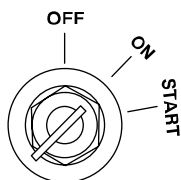


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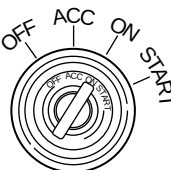


3484

- e. Turn the ignition key switch back to the "OFF" position, and squeeze the primer bulb again until it feels firm.
 - f. Turn the ignition key switch to the "ON" position again for three seconds.
 - g. Continue this procedure until the fuel primer bulb stays firm.
2. Turn the ignition key switch to the "ON" position.

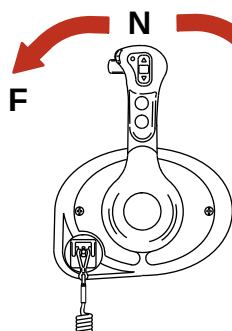


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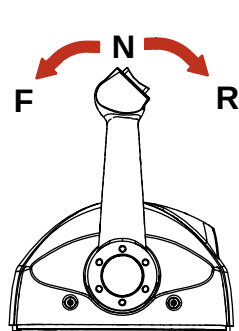


3484

3. Within the first 10 seconds after the key switch has been turned on, move the remote control handle from neutral (N) into forward (F). This will automatically start the priming process.



3413



3417

Purging Air From the Engine Oil Tank

IMPORTANT: DTS helm configuration must be completed before performing the following procedure.

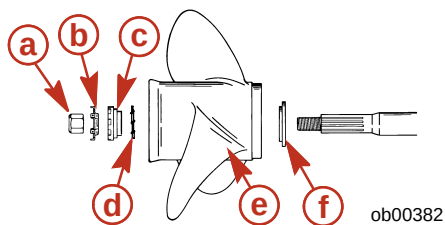
1. Loosen the fill cap on the engine oil tank.
2. Start the engine.
3. Operate the engine until all the air has vented out and oil starts to flow out of the tank.
4. Re-tighten fill cap.

Propeller Installation

⚠ WARNING

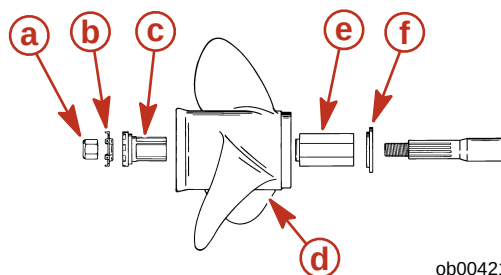
If the propeller shaft is rotated while the engine is in gear, there is the possibility that the engine will crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always shift outboard to neutral position and remove spark plug leads when you are servicing the propeller.

1. Flo-Torq I Drive Hub Propellers - Install forward thrust hub, propeller, continuity washer, rear thrust hub, propeller nut retainer, and propeller nut onto the shaft.



- a** - Propeller nut
- b** - Propeller nut retainer
- c** - Rear thrust hub
- d** - Continuity washer
- e** - Propeller
- f** - Forward thrust hub

2. Flo-Torq II Drive Hub Propellers - Install forward thrust hub, replaceable drive sleeve, propeller, thrust hub, propeller nut retainer and propeller nut onto the shaft.

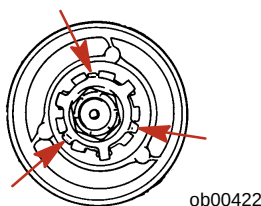


- a** - Propeller nut
- b** - Propeller nut retainer
- c** - Rear thrust hub
- d** - Propeller
- e** - Replaceable drive sleeve
- f** - Forward thrust hub

3. Place a block of wood between gearcase and propeller and torque to specifications.

Description	Nm	lb. in.	lb. ft.
Propeller nut	75		55

4. Secure propeller nut by bending three of the tabs into the thrust hub grooves.



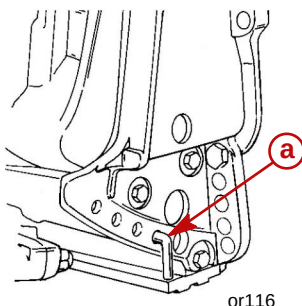
Trim In Pin

⚠ WARNING

Avoid possible serious injury or death. Adjust outboard to an intermediate trim position as soon as boat is on plane to avoid possible ejection due to boat spin out. Do not attempt to turn boat when on plane if outboard is trimmed extremely in or down and there is a pull on the steering wheel.

Some boats, particularly some bass boats, are built with a greater than normal transom angle, which will allow the outboard to be trimmed further in or under. This greater trim under capability is desirable to improve acceleration, reduce the angle and time spent in a bow high boat during planing off, and in some cases, may be necessary to plane off a boat with aft live wells, given the variety of available propellers and height range of engine installations.

However, once on plane, the engine should be trimmed to a more intermediate position to avoid a bow-down planing condition called plowing. Plowing can cause bow steering or over steering and inefficiently consumes horsepower.



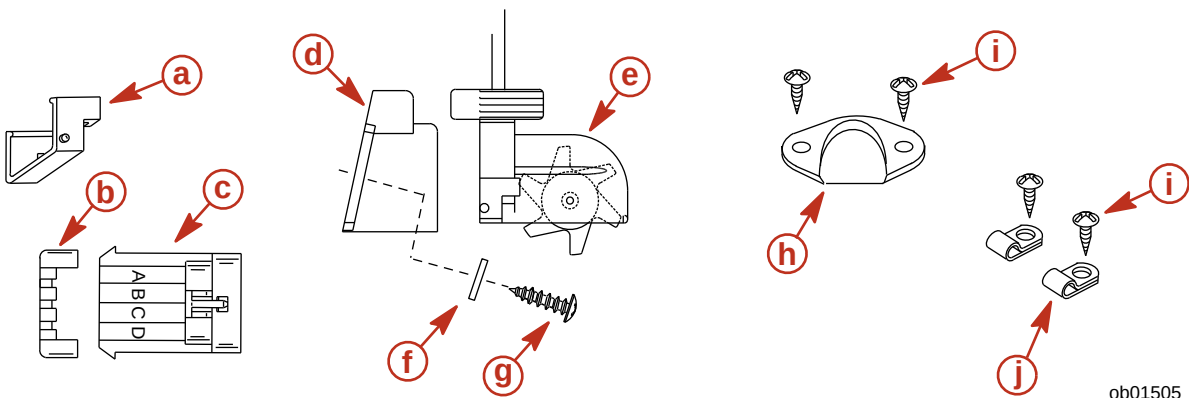
a - Tilt pin (not included with engine)

Stainless Steel Tilt Pin	17-49930A1
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The owner may decide to limit the trim in. This can be accomplished by purchasing a stainless steel tilt pin from your dealer and insert it in whatever adjustment hole in the transom brackets is desired. A non-stainless steel shipping bolt should not be used in this application other than on a temporary basis.

Paddle Wheel Speed Sensor Installation (If Equipped)

Parts Provided



- a** - Spare pin yoke
- b** - Wire retainer
- c** - Connector
- d** - Bracket
- e** - Paddle wheel

- f** - Flat washer (2)
- g** - #10 - 19 mm (3/4 in.) screw (4)
- h** - Cable cap
- i** - #6 - 12 mm (1/2 in.) screw (4)
- j** - Clamp (2)

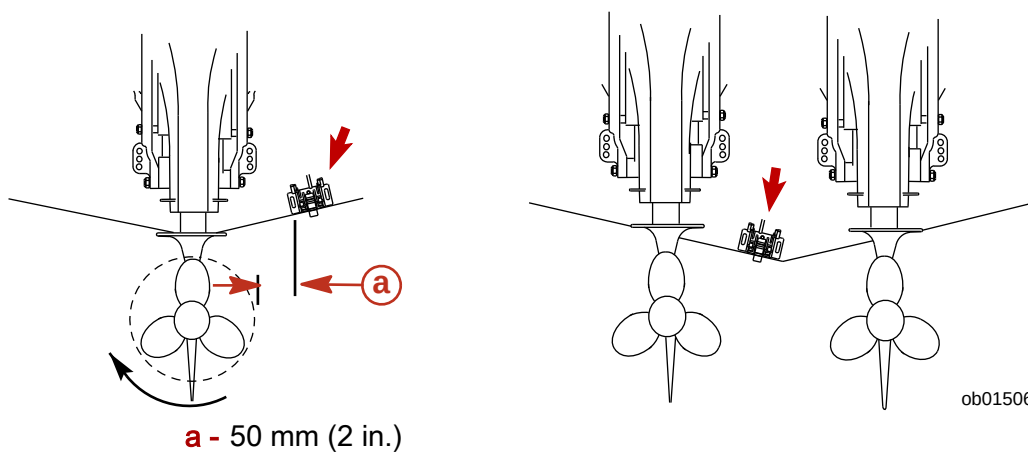
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Selecting Location

Single engine installation - Mount paddle wheel on the transom where the propeller blade is rotating downward. Usually the right (starboard) side to minimize cavitation. If feasible, mount at least 50 mm (2 in.) beyond the swing radius of the propeller.

Dual engine installation - Mount the paddle wheel between the engines as close to the center line (keel) of the boat as possible. On slower, heavier displacement boats, however, positioning it farther from the keel is acceptable.

NOTE: Do not mount the paddle wheel directly behind any stakes, ribs, intakes or outlets for live wells or any protrusion that may cause turbulence or cavitation.

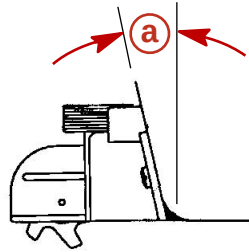


- a** - 50 mm (2 in.)

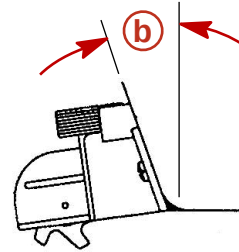
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Transom Angle Requirements

Standard 13° to 20° transoms - No special adjustment required.



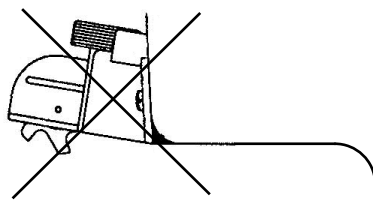
a - 13° transom angle



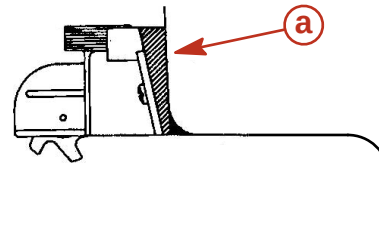
b - 20° transom angle

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Stepped or undercut transom with 3 angles - A small shim of tapered plastic, metal or wood must be fabricated and installed as shown. Mount the paddle wheel on the step for best performance.



a - Shim



ob01508

Installing Bracket

1. Cut out the template. At the location selected, tape the template to the transom. Make sure the black dotted line on the template is aligned with the transom bottom edge, as shown.

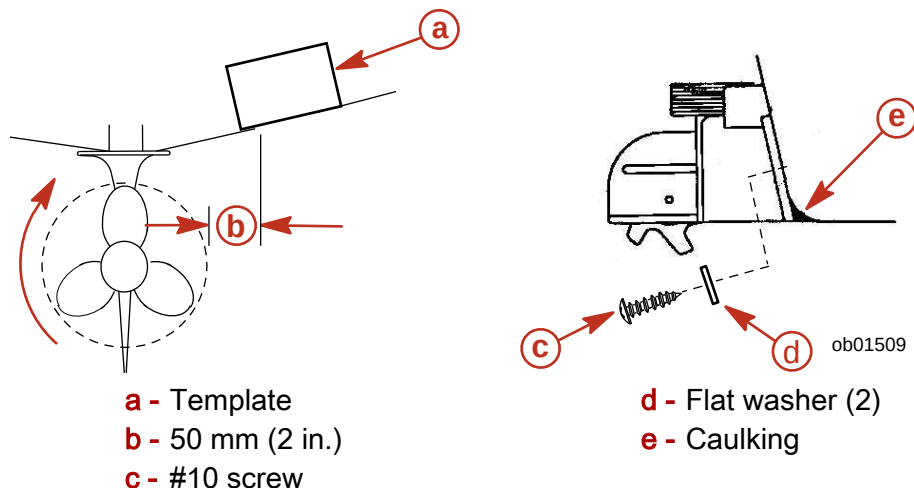
NOTE: The mounting template provided is located on the last page of this instruction sheet.

2. Using a #28 or 9/64 in. bit, drill two 22 mm (7/8 in.) deep holes where indicated on the template. To prevent drilling too deeply, wrap masking tape around the drill bit 22 mm (7/8 in.) from the point end of drill bit.

NOTE: In fiberglass hulls, first chamfer the gelcoat using a 6 mm (1/4 in.) drill; drilling about 15 mm (1/16 in.) deep to prevent surface cracks.

3. To prevent water seepage into the transom, apply a marine sealer (such as RTV) to the two #10 screws provided. Using the washer provided, attach and tighten the bracket to the hull making sure the bracket is flush with the underside of the hull.

4. Fill any gap between the housing and the transom with a caulking material, as shown. Using a putty knife, smooth the surface to ensure proper water flow.



Routing the Cable

DRILLING HOLE THROUGH TRANSOM (OPTIONAL)

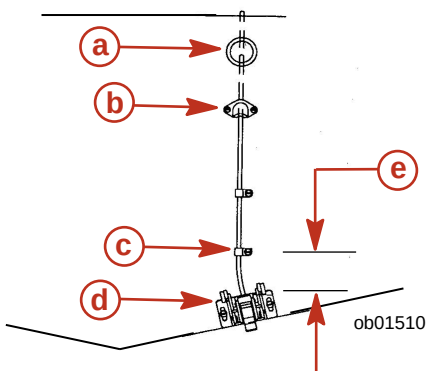
1. Select a transom location for the hole above the water line that does not interfere with other cables and controls.
2. Drill a 15 mm (5/8 in.) diameter hole.
3. Route the cable through the drilled hole. Seal the transom hole with silicone (RTV) or a comparable marine sealer after the cable has been routed through.

NOTE: The hole for the first clamp should be 25 mm (1 in.) above the paddle wheel. The hole for the second clamp should be positioned halfway between the first clamp and the cap covering the transom hole drilled for the cable.

4. Using a 2.8 mm (7/64 in.) bit, drill holes for the clamps and cap approximately 13 mm (1/2 in.) deep.
5. Apply silicone sealer (RTV) or a comparable marine sealer to the screw threads, install the cable clamps and feed the cable through cable cap.

WITHOUT DRILLING HOLE THROUGH TRANSOM (OPTIONAL)

Route the cable over the transom or through a drain hole that is above the water line.

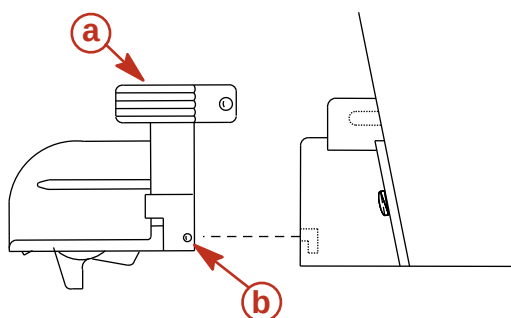


- a** - Splash well drain hole
- b** - Cable cap
- c** - Cable clamp
- d** - Paddle wheel assembly
- e** - Distance between first cable clamp and top of paddle wheel - 25.4 mm (1.0 in.)

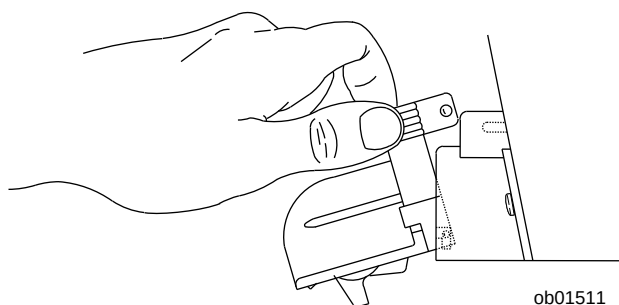
Installing and Removing the Paddle Wheel

Installation - Slide the pins into the slots in the bracket and snap the tabs into place.

Removal - squeeze open (unlock) the tabs and pull on the paddle wheel.



a - Tabs

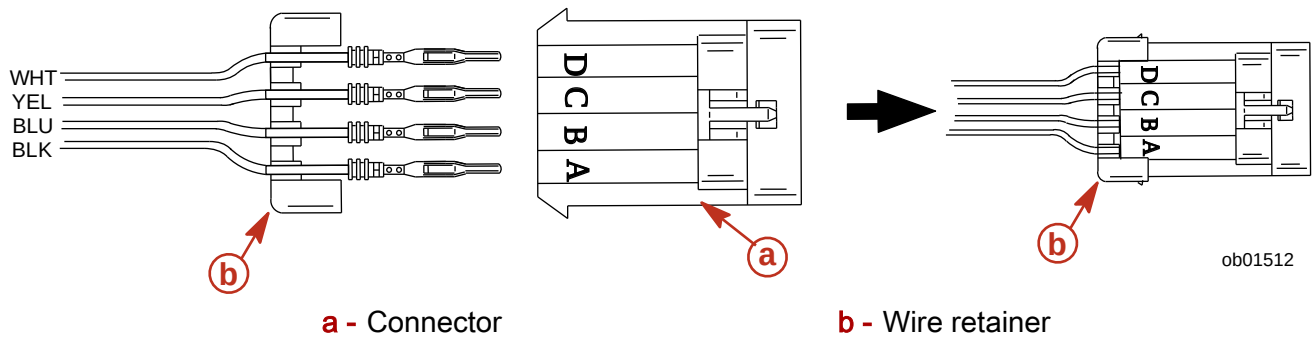


b - Pins

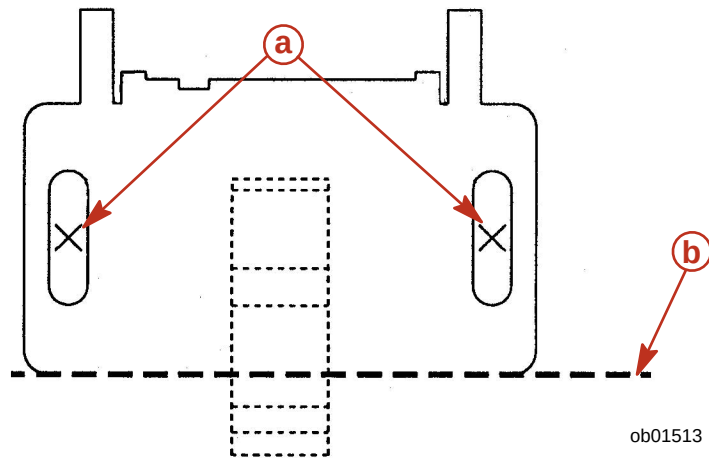
Wiring Connections

IMPORTANT: Before making wire connections, make sure wires are routed through the transom.

NOTE: Wires can only be pushed into the connector one way. Align the wire terminal with the tabs inside the connector. Have the wiring routed through the transom. Push each wire terminal into its respective location in the connector. Push wire in until they snap into place. Secure wires into connector with the wire retainer.



Template - Paddle Wheel Speed Sensor



a - Drill holes here

b - Align dotted line with the transom bottom edge and fold under